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April 16, 2008

By CM/ECF AND HAND DELIVERY

REDACTED – PUBLIC VERSION

The Honorable Gregory M. Sleet
U.S. District Court for the District of Delaware
J. Caleb Boggs Federal Building
844 N. King Street
Wilmington, DE 19801

Re: Keurig Incorporated v. Kraft Foods Inc. et al., C.A. No. 07-17-GMS

Dear Chief Judge Sleet:

Kraft's proposed motion would be futile because a host of fact issues preclude summary judgment on the question of invalidity based on prior public use under 35 U.S.C. § 102(b).[1]

As an initial matter, the testimony of Kraft's witnesses creates a dispute of material fact whether "public use" of Singles cartridges ever occurred at Kraft's private office.

Second, there is also a fact dispute over the nature of the cartridges at issue. So-called "Rychiger" cartridges and "Lambert" cartridges have different structures[2] and present different questions of fact when compared to the claims-in-suit for purposes of an anticipation analysis. Kraft does not argue that it would be entitled to summary judgment that Lambert cartridges (if they were prior art) would anticipate. Kraft relies solely on the Rychiger variety and therefore must establish, by clear and convincing evidence, that the cartridges its employees used at their office were Rychiger cartridges. Kraft's motion fails because substantial evidence suggests the opposite – that they were Lambert cartridges. At a minimum, there is a factual controversy.

[1] Fact disputes about "permeability" likewise preclude summary judgment on the question of infringement of claims 8 and 10. See infra p. 5.

[redacted]

Even if Kraft could establish that Rychiger cartridges were in public use at the relevant time, those cartridges would not anticipate because their foil lids are not "capable of being pierced to permit flow into and out of" the cartridge as required by the Court's construction. Keurig's independent technical expert, MIT Professor Alexander Slocum, tested the Singles cartridges and concluded that they do not meet these claim limitations. [redacted]

Kraft even argued to the Patent Office, in prosecuting its own patent applications, that Singles cartridges are not piercable through the foil lid to accommodate an inflow. See infra pp. 4-5. [redacted], Kraft has admitted that Keurig and Professor Slocum are right on the very issue that forms the basis of Kraft's invalidity theory. A summary judgment motion advancing the opposite position now would clearly be futile. Between Keurig's unrebutted expert testimony and Kraft's own admissions, there is at the very least a dispute of fact – not to mention a credibility question arising from Kraft's attempt to backtrack from its previous statements.

[redacted]

A. Kraft's Evidence of Public Use Is Deficient in Critical Respects.

Kraft presents no evidence that any member of the public ever used one of the Singles cartridges at Kraft's office. Kraft cites testimony of its own witness Ms. Glus (who worked for the CEO of Kraft's former parent company), but Kraft fails to acknowledge Ms. Glus's admission that (1) a member of the public could not have gained access to Kraft's office without being invited and passing through security; and (2) she has no recollection of any specific visitor to the office who actually used the Singles brewer. See Glus Depo. (Ex. 6) at 82-96.

Ms. Glus's testimony at least creates a fact issue as to whether the Singles cartridges in Kraft's offices were available to the public. Woodland Trust v. Flowertree Nursery, Inc., 148 F.3d 1368, 1371 (Fed. Cir. 1998) (reversing finding of invalidity: "[W]hen an asserted prior use is not that of the applicant, § 102(b) is not a bar when that prior use or knowledge is not available to the public."). The situation here mirrors that in Nesea Construction, Inc. v. Bilco Co., 2007 WL 1852289 (D.N.J. June 25, 2007), which involved alleged public use of a patented device on a ship. The fact that sailors (analogous to the Kraft employees in this case) had access to the device did not constitute a public use. As in this case, there was some evidence that members of the public had been permitted into the vicinity (to tour the ship), but the court nevertheless denied the defendant's motion for summary judgment of anticipation because the record did not establish clearly and convincingly what the visitors actually saw or did: "While it is wholly possible that visitors were able to view and use the [device], this Court cannot find that Bilco has presented clear and convincing evidence that this did in fact transpire." Id. at *4. Kraft's summary judgment motion would fail for the same reason.

Moreover, there is a factual dispute over whether the Singles cartridges in Kraft's offices were of the Rychiger or Lambert varieties. This is significant because if water is injected through the foil lid of a Lambert cartridge, much of the liquid exits through the open inlet hole on the opposite side of the cartridge, rather than through the outlet nozzle – another reason why the Lambert cartridge does not meet the limitations of the claims-in-suit. See Slocum Decl. (Ex. 2) ¶¶ 28-29. As noted above, Kraft does not even contend that it would be entitled to summary judgment of anticipation if the cartridges in public use were of the Lambert type.

Ms. Glus testified that she cannot recall whether the cartridges she used had an open inlet (Lambert) or were closed (Rychiger). (Ex. 6 at 66). Importantly, however, another Kraft witness, Ms. Greto, recalled the inlet being open. See Greto Depo. (Ex. 7) at 63-65. At the very least, this testimony creates a fact issue as to which cartridges were shipped by Kraft to the U.S.

[redacted]

[redacted] Ms. Greto's testimony that the cartridges she saw in the U.S. had an open inlet (i.e., Lambert), and Ms. Grus's inability to recall one way or the other, plainly creates a dispute of material fact precluding summary judgment.

B. Singles Cartridges Do Not Anticipate, as Kraft Has Admitted.

Singles cartridges are designed to be pierced on one side (through a hard plastic shell) for an inlet, and on the opposite side (through foil) for an outlet. See Slocum Decl. (Ex. 2) ¶¶ 9-12. [redacted]

Prior to this litigation, Kraft itself had argued that Singles cartridges were not piercable through the foil lid to accommodate an inflow. In a European patent application for its T-Disc (the accused product here), Kraft described the T-Disc almost exactly as Keurig's patent does, i.e., as having a lid that is "pierceable in use to accommodate an inflow." (Ex. 10 at 22, claim 1).

The Patent Examiner rejected Kraft's claim over prior art patents describing Singles, and Kraft responded by arguing that the Singles cartridge "is not designed to make it suitable for the laminate in that region to be pierced to form an inlet." (Ex. 11 at 1) (emphasis added).

Kraft's taking the same position in its own patent prosecution that Keurig and Professor Slocum have now articulated to the Court is a compelling reason to deny summary judgment.[6] On this point, Haberman v. Gerber Prods. Co., 236 Fed. Appx. 592 (Fed. Cir. 2007) is instructive. The defendant alleged patent invalidity on the ground that the prior art was capable

[redacted]

[6] Kraft's argument was not limited to Europe. Kraft also sought T-Disc patent claims in the U.S. [redacted]

of performing the claimed function. Yet in prosecuting one of its own patents, the defendant had earlier told the Patent Office that the same prior art was not capable of performing that function. Noting that the defendant had contradicted itself before the Patent Office, the Federal Circuit reversed the district court's judgment of anticipation. Id. at 598.

Kraft claims (Br. at 4) that its engineers have performed tests showing the Singles foil lid to be piercable to accommodate an inflow. Kraft's tests, however, merely multiply the fact issues here. [redacted] AstraZeneca AB v. Mutual Pharmaceutical Co., 278 F. Supp. 2d 491, 515 (E.D. Pa. 2003) (no anticipation shown by experiments "undertaken only for purposes of [the] litigation" which proved only that the limitation would be present "under certain laboratory conditions created by Defendant"). [redacted] Transclean Corp. v. Bridgewood Servs., Inc., 290 F.3d 1364 (Fed. Cir. 2002) (rejecting anticipation defense: "Although it is possible that the [prior art] could under some circumstances … effectively equalize the flow rates [as claimed], it is also possible for that not to be the case."). [redacted]

That the Court's claim construction uses the phrase "capable of" accommodating an inflow does not change the result as Kraft suggests. For example, in Medtronic Vascular, Inc. v. Adv. Cardiovascular Sys., 2005 WL 67085 (D. Del. Jan. 5, 2005), the claim recited a stent "capable of being compressed onto a catheter for delivery." Defendants argued that a prior-art stent anticipated because it could, in theory, have operated in the claimed manner under certain conditions. This Court rejected that defense because the prior-art stent worked differently from the stent claimed in the patent, and the prior art made "no reference to how it [could] be used in the patented manner." Id. at *9. Likewise, there is no dispute that Singles cartridges are designed for opposite-side piercing, not same-side piercing as claimed in Keurig's patent. [redacted]

C. The Facts of Record Support Validity and Infringement of Claims 8 and 10.

Kraft argues that it is entitled to a finding of invalidity or non-infringement for claims 8 and 10 because "the Kenco Singles Cartridge is less permeable to oxygen than the accused T-Disc." (Br. at 5). [redacted] Ex. 14 (Singles cartridge has one month shelf life). There is at least a fact question on infringement of claims 8 and 10 by the T-Disc because Keurig's expert Professor Slocum explains that it is impermeable within the meaning of claims 8 and 10. (Ex. 15 – Ex. C at 4). On the issue of validity, Kraft bears the burden of proof, by clear and convincing evidence, that Singles cartridges are impermeable, yet Kraft offers no such evidence, and even appears to take the opposite position in its brief (at 1-2). Summary judgment would plainly be inappropriate.

Respectfully submitted,

/s/ Karen E. Keller

Karen E. Keller (# 4489)

cc: Clerk of the Court (Redacted version by CM/ECF)
Rich Horwitz , Esq. (Redacted version by e-mail)
David Moore, Esq. (Redacted version by e-mail)
William Foster, Esq. (Redacted version by e-mail)
John Brown, Esq. (Redacted version by e-mail)

EXHIBIT 1

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 2

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

KEURIG, INCORPORATED, Plaintiff, v. KRAFT FOODS GLOBAL, INC., TASSIMO CORPORATION, and KRAFT FOODS INC., Defendants.	Civil Action No. 07-017 (GMS) **CONFIDENTIAL ATTORNEYS' EYES ONLY**

DECLARATION OF PROFESSOR ALEXANDER SLOCUM

Professor Alexander Slocum states as follows:

1. I have been retained by Keurig as an expert technical witness in this case.

2. I am a professor of Mechanical Engineering at the Massachusetts Institute of Technology. My principle fields of expertise are mechanical engineering, precision engineering, and machine design. My publications include two books on machine design, and approximately 170 papers published in refereed journals and in proceedings of refereed conferences.

3. I frequently consult for industry on the development of new products of various kinds. I am a named inventor on approximately 70 U.S. patents.

4. Awards I have received include the Society of Mechanical Engineers Prize for outstanding contributions to various fields related to mechanical engineering and manufacturing, the American Society of Civil Engineers Thomas Fitch Rowland Prize, the Society of Mechanical Engineers Frederick W. Taylor Research Medal, and the American Society of Mechanical Engineers Leonardo da Vinci Award. In 2000 I received the Massachusetts Professor of the Year Award.

5. A copy of my curriculum vitae is attached as Exhibit A to this declaration.

ASSIGNMENT

6. I have been asked by Keurig and its counsel to consider whether Kenco Singles cartridges manufactured and sold by Kraft satisfy the limitations of the claims in Keurig's U.S. Patent No. 6,607,762. I understand that I will be called upon to submit an expert report concerning these issues on May 13, 2008.

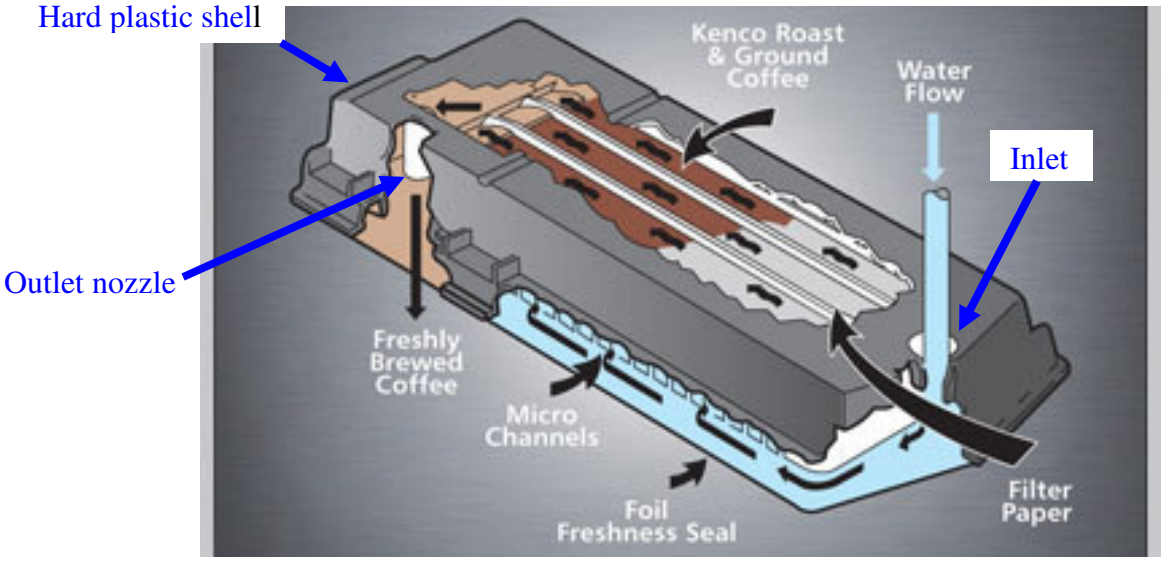
7. While my expert report is not due for a month, I have conducted preliminary testing of Singles cartridges under various conditions to evaluate whether they meet the requirements of the claims, including the requirement that they be "piercable to accommodate an inflow of liquid" to produce a beverage inside the cartridge (in the language of the Court's claim construction, "capable of being pierced to permit a flow of liquid into" to produce a beverage).

8. Similarly, the claims also require that the cartridge be "piercable to accommodate an outflow of the beverage" from the cartridge (in the language of the Court's claim construction, "capable of being pierced to permit a beverage to flow out").

KENCO SINGLES CARTRIDGES

9. Singles cartridges are single-serve beverage cartridges designed to be inserted into a Singles brewing machine to produce a cup of coffee. The Kraft diagram below (obtained from http://www.kencocoffeecompany.co.uk) shows how the Kenco Singles cartridge works.

10. The Singles cartridge has a generally rectangular, hard plastic shell with an opening on one side through which coffee grounds are introduced during manufacture. That opening is covered by a foil lid which faces down during the brewing process, as depicted in the diagram. Accordingly, in the diagram the plastic shell is visible but the downward-facing foil lid ("foil freshness seal") is not.



11. As shown in the diagram, the hard plastic shell of the Singles cartridge is provided with an inlet into which hot water is injected, under pressure, to begin the brewing process. After passing through the inlet, the pressurized water flows around the periphery of the cartridge in a narrow manifold that is provided with "microchannels" for even dispersal of water. The water is pumped through these microchannels into the central coffee bed. After mixing with the coffee grounds in the coffee bed, the beverage flows upward, against gravity, through a filter and into a second set of channels on the top side of the cartridge. The beverage then flows through those channels, across the top of the cartridge, and ultimately down through an outlet nozzle (shown in white on the left side of the diagram). Following manufacture, the nozzle is covered with the foil lid, but during the brewing process that portion of the lid is punctured and pushed out of the way to permit an outflow of beverage into a waiting cup.

12. Thus, the Singles cartridges are pierced on one side, through the hard plastic shell at the inlet, to accommodate an inflow of water, and on the opposite side, through the foil lid, to accommodate an outflow of beverage via the outlet nozzle.

13. For the cartridge to function properly, pumping water through two sets of small channels, up against gravity, and through a filter, the brewing process must take place at relatively high pressure. [redacted]

15. I have been asked to review two different variations of Singles cartridges, dubbed the "Rychiger" and "Lambert" cartridges after the production lines on which they are made. Some Singles production lines were apparently installed by the Rychiger company, while others were installed by the Lambert company. [redacted]

16. [redacted], there is a significant difference between Lambert and Rychiger cartridges – namely, Lambert cartridges are manufactured with an <u>open</u> inlet hole, while Rychiger cartridges are manufactured with a <u>closed</u> inlet hole that must be opened by a puncturing action at the time of brewing.

Open inlet hole (Lambert)

Closed inlet hole (Rychiger)

17. In use in a Singles brewer, this difference is immaterial because the inlet hole on the Rychiger cartridge is opened by a puncturing action at the beginning of the brewing cycle, and the subsequent injection of the water through the inlet of the two cartridges is identical.

18. When testing Singles cartridges in other modes of use for which they were not designed, however, the difference between Lambert and Rychiger cartridges can be important, as discussed below.

PRELIMINARY OBSERVATIONS ABOUT KRAFT'S CONTENTIONS

19. I understand that Kraft contends that the foil lid on Singles cartridges is piercable to accommodate both inflow of water and an outflow of beverage.

20. As a preliminary matter, this feature is not disclosed explicitly in the Singles cartridges themselves. When an engineer examines a Singles cartridge, it is immediately apparent from the cartridge design, including the flow paths described above and the beveled shape of the inlet, that the water is to be injected through the inlet in the hard plastic shell (on the right side in the diagram on page 3), with the beverage exiting through the nozzle (on the left side of the diagram) that is revealed by piercing and peeling back the foil covering.

21. There is no indication that the cartridge might be piercable to accommodate an inflow through the foil lid. In fact, piercing directly through the lid in an attempt to form an inlet would render useless a key feature of the cartridge, namely the manifold. The manifold, described briefly above, is designed and functions to spread the water out around the periphery of the coffee bed to more evenly wet the coffee grounds. Injecting water through the inlet provided in the plastic shell enables one to take advantage of the manifold; injecting directly through the foil lid into the coffee bed would bypass the manifold and forfeit the benefits of even coffee ground wetting.

22. Moreover, if an engineer were to consider piercing the foil lid to form an inlet (something I do not believe a person of skill in the art would be motivated to do, given the other features of the Singles cartridge already discussed) obtaining a satisfactory seal to accommodate an inflow would still be a major challenge, particularly at the Singles cartridges' high operating pressures.

23. Given these observations, in my opinion Singles cartridges do not disclose the concept of single-side piercing or the "capability" of being pierced through the foil lid to form an inlet and an outlet.

[redacted]

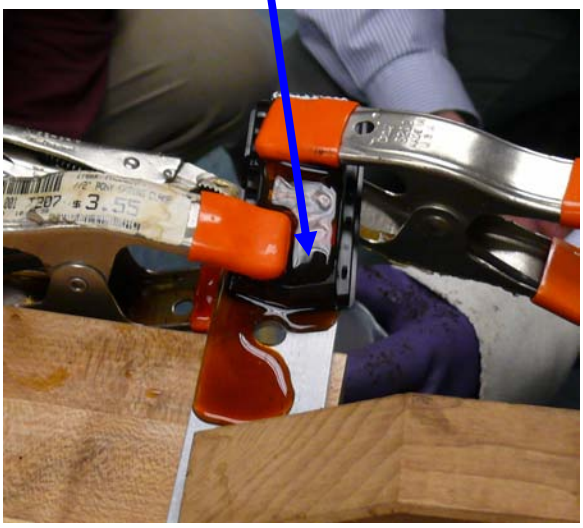
26. I have performed my own preliminary tests on Singles cartridges, which have led me to a different conclusion than Kraft's engineers.

MY PRELIMINARY TESTS OF SINGLES CARTRIDGES

27. As noted above, I plan to complete my testing and submit a full expert report on Kraft's invalidity allegations by the Court-ordered deadline of May 13, 2008. To date, however, I have performed several preliminary tests which led me to conclude that Singles cartridges are not piercable through the foil lid to accommodate an inflow of water and an outflow of beverage.

28. As a preliminary matter, my tests of so-called Lambert cartridges (i.e., cartridges with the open inlet as described above[1]) revealed that when water is injected through the foil lid, liquid exits through the open inlet hole on the opposite side of the cartridge. This defeats the purpose of the outlet nozzle through which a beverage is intended to exit the cartridge, and through which a beverage must exit in order for the Singles cartridge to meet the "outflow" limitation of the Keurig patent claims. The liquid exiting through the inlet makes a mess:

Beverage exiting through inlet hole on Lambert cartridge



Foil-side inlet piercing on Lambert cartridge leads to uncontrolled mess.

29. My tests of Lambert cartridges revealed that at least as much liquid exits through the inlet hole as through the outlet nozzle. While the liquid that exits through the outlet nozzle can be captured in a cup, the liquid that exits through the inlet hole cannot easily be captured and instead oozes out of the hole, dripping all over the cartridge and onto the floor. (Were the cartridge mounted inside a brewer, the coffee would of course drip into the brewer.)

[1] In some cases I modified Rychiger cartridges, by punching through the inlet hole, to simulate the conditions of a Lambert cartridge.

30. My tests of both Lambert and Rychiger cartridges also revealed another set of fundamental problems with creation of an inlet through the foil. The foil over the coffee bed lacks any kind of support structure against which to press a gasket or other device to form a seal. (By contrast, the Tassimo T-Discs that are accused of infringement in this case are provided with a support structure, such that their lids are piercable to accommodate an inflow.)

31. Accordingly, when attempting to pierce the foil lid over the coffee bed to create an inflow, with different needles, at a variety of pressures, and in a variety of orientations, I experienced spewing of coffee and liquid that was difficult to control, and danger of burns. On one occasion I was burned by the hot liquid flowing over my rubber glove and onto my forearm.

32. The following photograph is one example of the dangerous conditions that resulted when I attempted to pierce the foil side of a Singles cartridge to form an inlet for hot water.

COMMENTS ON KRAFT'S TESTING

[redacted]

CONCLUSION

37. While I plan to perform and document additional testing of Singles cartridges, my preliminary testing shows that Singles cartridges are not either explicitly or inherently piercable through the foil lid to accommodate an inflow of water and a quality outflow of beverage.

I declare under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge and belief.

Dated: April 16, 2008

Professor Alexander Slocum

Exhibit A

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

School of Engineering Faculty Personnel Record

Date: April 2008

Full Name: Alexander H. Slocum
Department: Mechanical Engineering

1. Date of Birth: on file

2. Citizenship: U.S.

3.

School	Degree	Date
M.I.T.	S.B., M.E	June 1982
M.I.T.	S.M., M.E	Jan. 1983
M.I.T.	Ph.D., M.E.	June 1985

4. Title of Thesis for Most Advanced Degree:

Sensor System Design to Determine Position and Orientation of Articulated Structures

5. Principle Field of Interest:

Precision Engineering

6. Name and Rank of Other Department Faculty in the Same Field:

Steven Dubowsky, Professor
Kamal Youcef-Toumi, Professor
Sanjay Sarma, Associate Professor
Sang-Gook Kim, Associate Professor
David Trumper, Professor
George Barbastathis, Assistant Professor
Martin Culpepper, Assistant Professor
Carol Livermore, Assistant Professor
Samir Nayfeh, Assistant Professor

7. Name and Rank of Faculty in Other Departments in Same Field:

Jeff Lang, Professor, Electrical Engineering
Martin Schmidt, Professor, Electrical Engineering

8. Non-MIT Experience:

Employer	Position	Beginning	End
NIST	Mechanical Engineer	June 1982	Sept. 1986
Cranfield Inst. Tech.	Visiting Professor	Oct. 1989	Oct. 1990

9. History of M.I.T. Appointments:

Rank:	Beginning	End
Assistant Professor (CE)	Sept. 1985	July 1989
Assistant Professor (ME)	July 1991	July 1992
Associate Professor (ME)	July 1992	July 1995
Associate Professor (ME, tenured)	July 1995	July 1998
Professor	July 1998	?

10. Consulting Record: (3 dozen+ companies, names available upon request)

11. Department and Institute Committees, Other Assigned Duties:

Activity	Beginning	End
Inst. Comm. on Design in UG Education	Feb. 1987	June 1988
Inst. UG Admissions Folder Reader	Jan. l987	Present
Inst. Committee on the Hobby Shop	July 1989	June 1997
Chairman, Inst. Committee -- Hobby Shop	June 1997	Present
Dept. Committee on Graduate Curricula	Oct. 1992	Present
Dept. Support Staff Cost Committee	Mar. 1994	May 1994
Pi Tau Sigma Faculty Advisor	May 1994	Jan. 2002
Dept. Faculty Search Committee	Jan. 1995	June 1995
Leader, OME 2nd Summer Design Program	Jan. 1996	Jan. 2008
MIT Educational Council	June 1996	Present
ME Strategic Planning Committee	Sept. 1996	June 1998
ME Design Faculty Search Committee	Jan. 1997	June 1998
Designated Course Professors Committee	Sept. 1997	June 2004
ME Design Faculty Search Committee	Jan. 1998	Nov. 1998
Space Committee	Jan. 2000	Sept. 2003
CalTech/MIT Voting Commission	Jan. 2001	June 2001
ME Council	Jan 2004	June 2005
Director: Experimental Study Group	Sept. 2004	Present
Research Administration Improvement Initiative (RAII)	July. 2005	Present
co-chair of the Class of 1982 Reunion Gift Fund	Spring 2007	

12. Professional Service:

Activity	Dates
Office of Secretary of Defense, Foreign Strategic Trade	June 1990-June 2005
Department of Justice, Bearing Tariffs	Jan.1992-Dec.1992
NIST, Technology Assessment	June 1986-Aug. 1997
Amer. Soc. Precision Eng., Nominations	May 1997-present
National Science Foundation, Review panel	June 1991-present
International Scientific Committee of the European Union Society for Precision Engineering and Nanotechnology	Feb. 2004-present
Session Chair “Education” 4th. Intl. Conf. Advanced Engineering Design, Glasgow, Scotland,	Sept. 5-8, 2004
Vice Chair, ASME Design Education Committee	2005
Session Chair ASME IDETC “Creativity in Design”, Las Vegas NV	Sept., 2007
Town of Bow Energy Conservation Committee	Dec, 2007-20012
Session Chair ASME IDETC “Creativity in Design”, NY, NY	Sept., 2008

13. Awards or Honors Received:

1. U.S. DoC Development of an Advanced Robot Gripper Feb. 1984
2. U.S. DoC Outstanding Performance Rating Mar. 1985
3. SME Outstanding Contribution to FMS Feb. 1986
4. U.S. DoC Outstanding Performance Rating Mar. l986
5. U.S. DoC Outstanding Performance Rating Mar. l986
6. U.S. DoC Development of Robotic Micromanipulator June l986
7. U.S. DoC Robot End Effector Patent July l986
8. U.S. DoC Robotic Micromanipulator Patent July l986
9. SME Outstanding Contribution to Robotics Aug.1986
10. U.S. DoC Bronze Medal Award for Federal Service Dec. 1986
11. NSF Presidential Young Investigator June 1987
12. Royal Society Visiting Scholar Fellowship Aug. 1988
13. Oak Ridge Offsite Research Fellowship Aug. 1988
14. SME Earl E. Walker Outstanding Young Manufacturing Engineer Award June 1993
15. ASCE 1994 Thomas Fitch Rowland Prize
16. 1994 R&D 100 Award for one of 100 best new technical products of the year (ShearDamper™)
17. 1994 International Machine Tool Show "Best of Show" award for development of Weldon Machine Tool's 1632 Gold Cylindrical Grinder (it used Slocum's hydrostatic bearings and ShearDamper technology).
18. 1994 R&D 100 Award for one of 100 best new technical products of the year (HydroGuide™)
19. 1995 R&D 100 Award for one of 100 best new technical products of the year (HydroSpindle™)
20. 1996 R&D 100 Award for one of 100 best new technical products of the year (TurboTool™ Ultra-High Speed Spindle)
21. SME 1997 SME Frederick W. Taylor Research Medal
22. 1997 R&D 100 Award -one of 100 best new technical products of the yr. (Machining Variation Analysis)
23. 1997 R&D 100 Award-- one of 100 best new technical products of the yr. (ShieldBeam™ Contactor)
24. 1997 R&D 100 Award-- one of 100 best new technical products of the yr. (Kinematic Docking System)
25. 1998 R&D 100 Award-- one of 100 best new technical products of the yr. (Q-Tool™)
26. Who's Who in America Science and Engineering
27. Martin Luther King Jr. Leadership Award, January 1999.
28. MacVicar Faculty Fellow, January 1999.
29. 1999 R&D 100 Award-- one of 100 best new technical products of the yr. (Quasi Kinematic Coupling for Engine Assembly)
30. Massachusetts Professor of the Year Award, November 2000
31. Who's Who Among America's Teachers
32. ASME Leonardo da Vinci Award, 2004
33. 100K Competición Winner (2007, Team Robopsy)

14. Current Organization Membership:

American Society of Mechanical Engineers, Fellow
Society of Manufacturing Engineers, Member
American Society for Precision Engineering, Member
IEEE, Member

15. Patents:

1) Slocum, "Mechanism for Determining Position and Orientation in Space", 4,606,696, August 19, 1986
2) Slocum, "Mechanism for Determining Position and Orientation in Space", 4,676,002, June 30, 1987
3) Slocum, J. Peris, "Method and Mechanism for Fixturing Objects", 4,685,661, August 11, 1987
4) A. Slocum, J. Peris, L. Greenspan, "Robotic Micromanipulator", 4,694,230, September 15, 1987
5) A. Slocum, P. Jurgens," Double End Effector", 4,765,668, June 23, 1988
6) A. Slocum, "Inclined Contact Recirculating Roller Bearing", 4,765,754, June 23, 1988 (NIST).
7) A. Slocum, "Method and Mechanism for Converting Rotary to Linear Motion", 4,836,042, June 6, 1989
8) A. Slocum, "Multiple Actuator Hydraulic System & Rotary Control Valve", 4,838,145, June 13, 1989
9) E. Heatzig, A. Slocum, "Multi-Axis DSP-Based Parallel Processing Servo Controller for Machine Tools and Robots", #4,878,002, October 31, 1989
10) A. Slocum, D. Thurston, "System to Provide High Speed, High Accuracy Motion", #4,987,526, Jan. 22, 1991
11) Z. Saidin, A. Slocum, "Brushless Motor Control Method and Device", #5,023,528, June 11, 1991
12) A. Slocum, A. Ziegler, "Automated Shear Stud Welding System", #5,130,510, July, 1992
13) A. Slocum, "System to Convert Rotary Motion to Linear Motion", #5,090,265, Feb. 25, 1992
14) A. Slocum, "Self Compensating Hydrostatic Linear Bearing", #5,104,237, April 14, 1992
15) A. Slocum, "Self -Compensating Hydrostatic Bearings for Supporting Round Shafts for Rotary and/or Linear Motion", #5,281,032, February 20, 1994
16) A. Slocum, "High Speed Hydrostatic Spindle", #5,466,071, Nov. 1995
17) A. Slocum, J. Olson, "Machine Tool Apparatus and Linear Motion Track Therefore", #5,472,367, Dec. 5, 1995
18) A. Devitt, A. Slocum, "Method for Manufacturing Externally Pressurized Bearing Assemblies", #5,488,771, Feb. 6, 1996
19) A. Slocum, K. Wasson, "Low Profile Self Compensated Hydrostatic Thrust Bearing", #5,533,814, July 1996
20) A.Slocum, "Slit-Tube Replicated In-Place Constrained Layer Damper and Method", #5,667,204, September 1997
21) A. Slocum, D. Braunstein, L. Muller, "Flexural Kinematic Couplings", #5,678, 944, October 1997
22) N. Kane, A. H. Slocum, "Elastically Supported Self-Compensating Flow Restrictors for Optimizing Hydrostatic Bearing Performance", #5,484,208, Jan. 1996
23) A. Slocum, "Method and Apparatus for Locating and Orienting a Part on a Gripper and Transferring it to a Tool while Maintaining Location and Orientation on the Tools", 5,711,647, January 1998
24) A. Slocum, T. Solomon, "Robotic Joint Using Metal Bands", # 5,682,795, December 1997
25) K. L. Wasson & A.H. Slocum, "Integrated Shaft Self-Compensating Hydrostatic Bearing", #5,700,092, Dec. 23 1997
26) A. Slocum, K. Wasson, "Tooling System and Method with Integral Hydrostatic Bearings and Turbine Power Source", #5,674,032, Oct. 7, 1997
27) A. Slocum, "Method and Apparatus for Damping Bending Vibrations While Achieving Temperature Control in Beams and Related Structures", #5,743,326
28) A. Slocum, "Kinematic Coupling Fluid Couplings and Method", #5,683,118
29) A. Slocum, et-al, "Modular System", #5,733,024, March 31, 1998
30) A. Slocum, S. Ziegenhagen, R. Slocum, L. Muller, "Integrated Circuit Tray with Flexural Bearings", #5,758,776, June 2, 1998
31) M. Culpepper, A. Slocum, "Debris cleaner with compound auger and vacuum pickup", 5,784,756 July 28, 1998
32) A. Slocum, M. Chiu, "Interface Apparatus for Automatic Test Equipment", #5,821,764, Oct. 1998
33) A. Slocum, E. Marsh, D. Smith, "Replicated In-Place Internal Viscous Shear Damper for Machine Structures and Components", #5,799.924, Sept. 1, 1998
34) A. Slocum, "Surface Textured Cleansing Device and Method with Massaging Effect", #5,834,410, Nov. 10, 1998
35) A. Slocum, S. Ziegenhagen, "Expanding Gripper with Elastically Variable Pitch Screw", #5,839,769, Nov. 24, 1998

36) A. Slocum, “Kinematic Coupling Method And System For Aligning Sand Mold Cores And The Like And Other Soft Objects And Surfaces”, #5,769,554
37) A. Slocum, J. Miskoe, “Container Restraining Mechanism and Method, #5,848,669, Dec. 15, 1998
38) A. Slocum, et. al., “I.S. Machine” (bottle making machine for Emhart Glass), #5,858,050, Jan. 12, 1999
39) A. Slocum, et. al., “Mold Carrier Assembly for an I.S. Machine Mold Opening and Closing Mechanism” (bottle making machine for Emhart Glass), #5,865,868, Feb. 2, 1999.
40) A. Slocum, et. al., “Mold Opening and Closing Mechanism for an IS Machine”, #5,887,450, March, 1999
41) A. Slocum, C. Ho, “Modular Storage System, Components, Accessories, And Applications To Structural Systems And Toy Construction Sets And The Like”, # 5,888,114, March 30, 1999
42) A. Slocum, D. Braunstein, “Kinematic Coupling for Thin Plates and Sheets and the Like”, #5,915,678, June 29, 1999
43) A. Slocum, “Method of Manufacturing Ball Grid Arrays for Improved Testability”, #5,924,003, Jul. 13, 1999.
44) A. Slocum, R. Ziegenhagen, “Flexible shielded laminated beam for electrical contacts and the like and method of contact operation”, #5,921,786, July 1999
45) A. Slocum, et. al., “Manipulator for Automatic Test Equipment Test Head”, #5,931,048, Aug. 3, 1999.
46) Mungovan, J.P. et. al. “IS Machine”, # 5,938,809, August, 1999.
47) A. Slocum, “Method of and apparatus for substance processing with small opening gates actuated and controlled by large displacement members having fine surface finishing”, #5,964,242, Oct. 1999
48) A. Slocum, D. Gessel, “Semiconductor chip tray with rolling contact retention mechanism”, #5,971,156, Oct. 26, 1999
49) N. Kane, A. Slocum, “Modular Hydrostatic Bearing with Carriage Form-Fit to Profile Rail”, #5,971,614, Oct. 1999
50) A, Slocum; Alexander, R. Ziegenhagen, R. Richard, “Small contactor for test probes, chip packaging and the like”, # 5,973,394, Oct. 26, 1999
51) M. Chiu, D., Levy, A. Slocum, “Interface Apparatus for Automatic Test Equipment With Positioning Modules Incorporating Kinematic Surfaces”, #5,982,182, Nov, 1999
52) A. Slocum, “Method of Manufacturing Ball Grid Arrays for Improved Testability”, #5,924,003, July 13, 1999
53) A. Slocum, L. Muller, “Integrated Prober, Handler, and Tester for Semiconductor Applications”, 6,024, 526, Feb. 2000
54) A. Pfahnl, A. Slocum, J. Lienhard, “Heat-transfer enhancing features for semiconductor carriers and devices”, #6,036,023, March 14, 2000
55) A. Slocum, M. Chiu, “Interface Apparatus for Automatic test Equipment “, #6,104,202, August, 2000
56) A. Slocum, “System to Simultaneously Test Trays of Integrated Circuit Packages“, #6,097,201, August 2000.
57) A. Slocum, “Linear motion carriage system and method with bearings preloaded by inclined linear motor with high attractive force”, #6,150,740, Nov., 2000
58) M. Culpepper, A. Slocum, “Quasi-Kinematic Coupling and Method for Use in Assembling and Locating Mechanical Components and the Like”, # 6,193,430, Feb. 2001
59) A. Slocum, K. Wasson, “Damped tool holder and method”, #6,280,126, Aug, 2001
60) T. Brogardh, H. Jerrerd, A. Robertson, A. Slocum, P. Willoughby, “Device and a method for calibration of an industrial robot”, #6,418,774, July 2002
61) A. Slocum, “Single carriage robotic monorail material transfer system”, 6,446,560, Sept. 10, 2002
62) A. Slocum, A. Pfahnl, E. Walker, R. Sartschev, “Temperature control structure”, #6,448,575, September 10, 2002
63) A. Slocum, “Robust, small scale electrical contactor”, #6,497,581, Dec. 24, 2002.
64) S. Awtar, A. Slocum, "Apparatus Having Motion with Pre-Determined Degrees of Freedom", #6,699,183, Feb. 10, 2004
65) S. Longson, A. Slocum “Wafer Level Contactor”, #6,768,331, July 27, 2004.
66) J. Cherng, M. Cima, J. Gonzalez-Zugasti, N. Kane, A. Lemmo, C. Moore, A. Slocum, “Method and apparatus for manipulating and measuring solids”
67) J. Qiu, A. Slocum, J. Lang, R. Struempler, M. Brenner, J. Li, „Bistable Actuation techniques, Mechanisms, and Applications“, # 6,911,891, June 28, 2005

68) A.H. Slocum, S. Awtar, A.J. Hart. "Material Transportation System", U.S. Patent 6,886,651, May 3, 2005.
69) A.H., Slocum. J. Lang, J. R. White; H. Ma, X. Yang, "Variable electronic circuit component" 6,914,785, July 5, 2005
70) A.H. Slocum, "Flexible Connector", US Patent 7,040,949, May 9, 2006.
71) About a dozen more misc. pending

16. Professional Registration: None.

17. Major New Products, Processes, Designs, or Systems:

- SEMI E57-1296 Kinematic Coupling Standard. I proposed to SEMI/Sematech a new standard for locating 300 mm wafer cassettes, and then led the formulation and implementation of the standard, which is now in use by all companies for 300 mm semiconductor wafer cassettes and interfaces
- OMAX Jet Machining Center (3 different models). See: www.omax.com.
- Weldon 1632 Gold Grinder
- International Machine Tool Show (IMTS:"Best of Show" award for development Weldon Machine Tool's 1632 Gold Cylindrical Grinder (it used Slocum's hydrostatic bearings and ShearDamper technology), Sept. 1994.
- ShieldBeam Contactor, manufactured by Teradyne, which won an R&D 100 Award for one of 100 best new technical products of the year, June 1997.
- K-Dock Kinematic Docking System, manufactured by Teradyne, which won an R&D 100 Award for one of 100 best new technical products of the year, June 1997.
- Executive Producer for inner-city kids' rap group Mental Block, their first CD entitled, "IF".
- Kinetrix, Inc. (a new startup I helped create) Apollo Semiconductor Device Sorter and Galileo Semiconductor Device Handler
- Created web sites and programs for the Urban Design Corp (www.urbandesigncorp.org), and Paths-to-Peace (www.pathstopeace.org) to help teach kids to design and create and to promote better understanding between cultures.
- Advised 2nd Summer students as UROPs to pursue patenting their device "Ergonomic Cleaning Apparatus with Multiple Scrubbing Surfaces", US Patent # 5,915,869, June 1999.
- Worked with Overbeck Corp. of Long Island, NY to create the LT Grinding machine, which was featured as a cover article: "Get a Preload of This", American Machinist, December 2002.
- Executive Producer for "Journey of The Lost Souls" by Marc Graham (book of poems and rap CD)
- Dial Soap "Quest for the Best" consumer product search finalist for "Massagasoap"
- NoodleNodes™ foam pool toy (www.noodlenodes.com)

Teaching Experience of Alexander H. Slocum

Term	Subject Number	Title	Role
ST 1986	1.965	Special Studies in Civil Engineering	Lect. in Charge
FT 1986	1.964	Design for Construction Automation*	Lect. in Charge
ST 1987	1.13	Design for Construction Automation*	Lect. in Charge
FT 1987	1.08	Introduction to Robotics*	Lect. in Charge
FT 1987	1.502A	Freshman Seminar "Design of Machine Systems"	Lect. in Charge
ST 1988	1.13	Design for Construction Automation*	Lect. in Charge
FT 1988	2.70	Introduction to Design	Recitation
FT 1988	1.S04	Fr Freshman Seminar "Precision Machine Design"	Lect. in Charge
ST 1989	2.996	Precision Machine Design*	Lect. in Charge
FT 1991	2A08	Freshman Seminar: Precision Machine Design*	Lect. in Charge
FT 1991	2.731	Advanced Engineering Design	Co-lecturer
ST 1992	2.732	Advanced Engineering Design	Co-lecturer
ST 1992	2.840	Precision Machine Design*	Lect. in Charge

FT 1992	2A08	Freshman Seminar: Precision Machine Design*	Lect. in Charge
FT 1992	2.731	Advanced Engineering Design	Co-lecturer
ST 1993	2.732	Advanced Engineering Design	Co-lecturer
ST 1993	2.75	Precision Machine Design*	Lect. in Charge
FT 1993	2A08	Freshman Seminar: Precision Machine Design*	Lect. in Charge
FT 1993	2.72	Machine Elements	Co-lecturer
ST 1994	2.75	Precision Machine Design*	Lect. in Charge
FT 1994	2A08	Freshman Seminar: Precision Machine Design*	Lect. in Charge
FT 1994	2.73	Design	Co-Lect. in Charge
ST 1995	2.70	Introduction to Design	Lect. in Charge
FT 1995	2A08	Freshman Seminar: Design of Toys & Games*	Lect. in Charge
FT 1995	2.75	Precision Machine Design*	Lect. in Charge
IAP 1996	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 1996	2.70	Introduction to Design	Lect. in Charge
FT 1996	2A08	Freshman Seminar: Design of Toys & Games*	Lect. in Charge
FT 1996	2.75	Precision Machine Design*	Lect. in Charge
IAP 1997	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 1997	2.007	Design & Mfg I*	Lect. in Charge
IAP 1998	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 1998	2.75	Precision Machine Design*	Lect. in Charge
ST 1998	2.007	Design & Mfg I*	Lect. in Charge
FT 1998	2.009	Product Design Section Instructor	
IAP 1999	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 1999	2.007	Design & Mfg I*	Lect. in Charge
IAP 2000	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 2000	2.007	Design & Mfg I*	Lect. in Charge
ST 2000	2.75	Precision Machine Design*	Lect. in Charge
IAP 2001	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 2001	2.007	Design & Mfg I*	Lect. in Charge
FT 2001	2.75	Precision Machine Design*	Lect. in Charge
FT 2001	2.997	(J with 6.963 Medical Innovation)	Co-Lect. in Charge
IAP 2002	2.971	2nd Summer Intro. to Design*	Lect. in Charge
IAP 2002	2.996	Paths to peace*	Lect. in Charge
ST 2002	2.007	Design & Mfg I*	Lect. in Charge
FT 2002	2.996	Paths to peace*	Lect. in Charge
IAP 2003	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 2003	2.007	Design & Mfg I*	Lect. in Charge
FT 2003	SP247	8.01 Physics with Sports*	Lect. in Charge
FT 2003	2.75	Precision Machine Design*	Lect. in Charge
IAP 2004	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 2004	2.007	Design & Mfg I*	Lect. in Charge
FT 2004	SP247	8.01 Physics with Sports*	Lect. in Charge
FT 2004	2.75	Precision Machine Design*	Lect. in Charge
IAP 2005	2.971	2nd Summer Intro. to Design*	Lect. in Charge
ST 2005	2.007	Design & Mfg I*	Lect. in Charge
FT 2005	2.75	Precision Machine Design*	Lect. in Charge
ST 2006	2.007	Design & Mfg I*	Lect. in Charge
FT 2006	2.75	Precision Machine Design*	Lect. in Charge
ST 2007	2.007	Design & Mfg I*	Lect. in Charge

* Indicates subject developed by Slocum

Publications of Alexander H. Slocum

1. Books:

1) Slocum, A. H., Precision Machine Design, © 1995, Society of Manufacturing Engineers, Dearborn, MI. (first published by Prentice Hall in 1992)
2) Handbook of Human-centered Design (Japanese), Section 7.3
2) Slocum, A. H., FUN*da*MENTALS of Design, Cambridge University Press (in press)

2. Papers in Refereed Journals:

1) McClintock, F. A., Slocum, A. H., "Predicting Fully Plastic Mode II Crack Growth from an Asymmetric Weld Defect," International Jrl. of Fracture Vol. 27, 1985, pp 49-62.
2) Slocum, A. H., "Design to Limit Thermal Effects on Linear Motion Bearing Components," Int. Jrl. Machine Tool Design, Vol. 27, No. 2, 1987, pp 239-245.
3) Slocum, A. H., Greenspan, L., Peris, J.P., "Design and Implementation of a Five Axis Robotic Micro-manipulator," Int. Jrl. Machine Tool Design, Vol. 28, No. 2, 1988, pp 131-141.
4) Slocum, A. H., "Development of a Six Degree-of-Freedom Position and Orientation Sensing Device: Design Theory and Testing," Int. Jrl. Machine Tool Design, Vol. 28, No. 2, 1988, pp 131-139.
5) Slocum, A. H. "Kinematic Couplings for Precision Fixturing - Part I - Formulation of Design Parameters," Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 10, No. 2, April 1988, pp 85-91.
6) Slocum, A. H. and Donmez, A., "Kinematic Couplings for Precision Fixturing - Part II - Experimental Determination of Repeatability and Stiffness," Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 10, No. 3, July 1988, pp 115-122.
7) *Slocum, A. H. and Schena, B., "Blockbot: A Robot to Automate Construction of Cement Block Walls," Robotics, Vol. 4, 1988, pp 111-129.
8) *Slocum, A. H. and Ziegler, A., "An Automated Shear Stud Welding System," Jrl. Robotics and Autonomous Systems, Vol. 6, 1990, pp 367-382.
9) Slocum, A. H. "Design of Three-Groove Kinematic Couplings," Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 14, No. 2, April 1992, pp 67-76.
10) *Battles, A.E., Linder, B. M., Chang, K.W., Slocum, A.H., "The Design of a Precision Bilaminar Resonating Transducer Assembly Tool", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 15, No. 4, Oct. 1993, pp 248-257.
11) *Everett, J. G., and Slocum, A. H. "CRANIUM: Device for Improving Crane Safety and Productivity," ASCE Jrl. Construction Engineering and Management, 1994, 119 (1), pp 1-17. Received the ASCE 1994 Thomas Fitch Rowland Prize.
12) *Smith, M.H., Annaswamy, A.M., Slocum, A.H., "Adaptive Control Strategies for a Precision Machine Tool Axis", Precision Engineering, Vol. 17, No. 3, 1995, pp. 192-206.
13) *Slocum, A. H., Marsh, E.R., Douglas H. Smith, "A New Damper Design for Machine Tools and Components: "The Replicated Internal Viscous Damper," Precision Eng, Vol. 16, No. 3, June. 1994, pp 174-183.
14) *Slocum, A.H., Scagnetti, P.E., Kane, N.R., Brünnner, C., "Design of Self Compensated Water-Hydrostatic Bearings", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 17, No. 3, 1995, pp 173-185.
15) *Hale, L.C., Slocum, A.H., "Design of Anti-Backlash Transmissions for Precision Position Control Systems", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 16, No. 4, Oct. 1994, pp. 244-258.
16) *M. Van Doren. and A. Slocum, "Design and Implementation of a Precision Material Handling Robot Control System," Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 35, No. 7, July 1995, pp. 1003-1014.
17) *Marsh, E.R., Slocum, A.H., "An Integrated Approach to Structural Damping," Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 18, Nos. 2/3, 1996, pp 103-109.
18) Schmiechen, P., Slocum, A.H., "Analysis of Kinematic Systems: a Generalized Approach", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 19, No. 1, July 1996, pp. 11-18.

19) Pfahnl, A. C., Lienhard V, J. H., Slocum, A.H., "Heat Transfer Enhancing Features for Handler Tray-Type Device Carriers", IEEE Transactions on Components, Packaging, and Manufacturing Technology Part C: Manufacturing, Vol. 21, No. 4, October 1998.
20) *Kotilainen, M., Slocum, A. "Manufacturing of Cast Monolithic Hydrostatic Journal Bearings", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 25 (2001), pp. 235-244.
21) Hale, L, Slocum, A, "Optimal design techniques for Kinematic Couplings", Jou. Int. Soc. of Precision Engineering and Nanotechnology, April 2001, vol. 24, number 2, pp. 114-127
22) *Balasubramaniam, M., Dunn, H., Golaski, E., Son, S., Sriram, K., Slocum, A., "An Anti Backlash Two-Part Shaft Coupling with Interlocking Elastically Averaged Teeth", Precis Eng., Volume 26, July 2002, No. 3 pp. 314-330, 2002
23) *Bamberg, E, Slocum, A., "Concrete-Based Constrained Layer Damping", Jou. Int. Soc. of Precision Engineering and Nanotechnology., 26 (2002) 430-441
24) *Kane, N. R., Sihler, J., Slocum, A.H., "A hydrostatic rotary bearing with angled surface self-compensation", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Volume 27, Issue 2, April 2003, Pages 125-139
25) *Son, S., Sarma, S., Slocum, A., "A Hybrid 5-Axis CNC Milling Machine", accepted for publication in Precision Engineering.
26) *O'Sullivan, D., Q., "Slocum, A.H., "Design of Two-Dimensionally Curved Panels for Sandwich Cores", Journal of Sandwich Structures and Materials, Vol. 05 Issue 01, 1 January 2003, pp 77.
27) Slocum, A., Basaran, M., Cortesi, R., Hart, A.J., "Linear Motion Carriage with Bearings Preloaded by Inclined Iron Core Linear Electric Motor", Jou. Int. Soc. of Precision Engineering and Nanotechnology, 27 (2003) 382-394
28) *Slocum, A., Weber, Alexis, "Precision Passive Mechanical Alignment of Wafers", IEEE JMEMS, Dec. 2003, Vol. 12, No. 6, pp 826-834.
29) *Brenner M.P., Lang J. H., Li J., Qiu, J., Slocum A. H., "Optimal, design of a bistable switch", PNAS, August 19, 2003, Vol. 100, No. 17, 9663-9667.
30) *White, J., Ma. H., Lang, J. and Slocum, A. "An instrument to control parallel plate separation for nanoscale flow control." Rev. Sci. Inst. v. 74 no. 11, Nov. 2003.
31) Hart, A.J., Slocum, A., Willoughby, P., "Kinematic Coupling Interchangeability", Jou. Int. Soc. of Precision Engineering and Nanotechnology, 28:1-15, 2004.
32) *Vallance, R.R., Slocum, A., "Precisely positioning pallets in multi-station assembly systems", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol 28/2 pp 218-231
33) *J. Qiu, J. Lang, and A. Slocum, "A curved-beam bistable mechanism", JMEMS, Volume 13 page 137-147, April 2004.
34) *Li, J, Brenner, M., Christen, T., Lang, J., Slocum, A. "DRIE Etched Compliant Starting Zone Electrostatic Zipping Actuators", Accepted by JMEMS, Nov. 2004
35) Culpepper, M. L., A. H. Slocum, F. Z. Shaikh and Vrsek, G., "Quasi-kinematic Couplings for Low-cost Precision Alignment of High-volume Assemblies," ASME Jou. of Mech. Design, Vol. 126 (4), pp. 456-63.
36) Hart, A.J., Slocum, A.H., "Segmented and shielded structures for reduction of thermal expansion-induced tilt errors", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol 28, Issue 4, Oct 2004, p. 443-458.
37) *P.J. Willoughby, A.J. Hart, A.H. Slocum. Experimental Determination of Kinematic Coupling Repeatability in Industrial and Laboratory Conditions, SME J. Manufacturing Systems 24:108-121, 2005,
38) *Hou, S.M., Lang, J.H., Slocum, A.H., Weber, A.C., White, J.R., "A High-Q Widely-Tunable Gigahertz Electromagnetic Cavity Resonator", JMEMS, vol. 15, no. 6, pp. 1540-1545, Dec. 2006.
39) * Plante, JS, Vogan, J.D., El-Aguizy, T, Slocum, A.H., "A Design Model for Circular Porous Air Bearings Using the 1D Generalized Flow Method", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 29 (2005) 336–346
40) *El-Aguizy, T., Vogan, J.D., Plante, J.S., Slocum, A.H., "Frictionless compression testing using load-applying platens made from porous graphite aerostatic bearings", Rev. Sci. Instrum. 76, 075108, 2005.

41) *Qiu, J, Lang, J, Fellow, Slocum, A., Weber, A, "A Bulk-Micromachined Bistable Relay With U-Shaped Thermal Actuators", Journal Of Microelectromechanical Systems, Vol. 14, No. 5, October 2005, pp 1099-1109.
42) *Robertson, A.P., Slocum, A.H., "Measurement and characterization of precision spherical joints", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Vol. 30 (2006) 1–12
43) *Werkmeister, J.B., Slocum, A.H., "Theoretical and Experimental Determination of Capstan Drive Stiffness", Jou. Int. Soc. of Precision Engineering and Nanotechnology, Volume 31, Issue 1, January 2007, Pages 55-67
44) Bamberg E, Grippo CP, Wanakamol P, Slocum AH, Boyce MC, Thomas, EL, "A tensile test device for in situ atomic force microscope mechanical testing", Precision Engineering, 30 (2006), pp. 71-84.
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108) Boskovic, B.O., Hart, A.J., Chuang, A.T.H., Golovko, V.B., Johnson, B.F.G., Slocum, A.H., Robertson, . Carbon nanotube synthesis on arbitrary three-dimensonal surfaces", International Carbon Conference, Aberdeen, Scotland, 2006.
109) *Hart, A.J., Taylor, H.K., Slocum, A.H., "Three-dimensional growth of carbon nanotubes on substrates: from nm-to mm-scales", 4th International Symposium on Nanomanufacturing, Cambridge, MA, 2006.
110) *van Laake, L.C., Hart, A.J., Slocum, A.H. "Growth and in-situ optical characterization of aligned carbon nanotube monoliths using a desktop reactor apparatus with rapid thermal control", Materials Research Society Fall Meeting, Symposium Q, Boston, MA, 2006.
111) Gupta, R., Hanamura, N., Slocum, A., Walsh, C., "A Tele-Robotic, Percutaneous Biopsy Assistant", ASME BioMed 2007
112) A.C. Weber1, G. Bassiri, B.M. Dvorak, A.H. Slocum, D.A. Lucca, J.H. Lang, "Atomic Plane Electrical Contacts" tth International Conference of the European Society of Precision Engineering and Nanotechnology, Bremen, Germany 2007.
113) A.C. Weber, J. H. Lang, A.H. Slocum, "{111} Si etched planar electrical contacts for power MEMS-relays", to be presented at the 53rd IEEE Holm Conference on Electrical Contacts, September 2007, Pittsburgh, PA
114) N. Yamamoto, E. J. Garcia, A. J. Hart, B. L. Wardle, A. H. Slocum, "Fabrication And Multifunctional Characterization Of Hybrid Woven Composites Reinforced By Aligned Carbon Nanotubes", 16th International Conference On Composite Materials
115) E. J. Garcia, A. J. Hart, B. L. Wardle, A. H. Slocum, D. Shim, "Aligned Carbon Nanotube Reinforcement Of Graphite/Epoxy Ply Interfaces", 16th International Conference On Composite Materials

116) N Hanumara, R. Gupta, J. Shephard, A. Slocum, C. Walsh, "Interface Design for a Low-Cost, Image-Guided, Tele-Robotic Biopsy Assistant", 29th IEEE EMBS Annual International Conference to be held in Cité Internationale, Lyon, France during August 23-26, 2007
117) Ma, H, Slocum, A.H., "Design Of An Injection-Molded Impedance Cell For Measuring The Dielectric Constant And Conductivity Of Liquids And Gases Across Adjustable Nanometer Electrode Gaps", ASPE 2007 mtg, Dallas, TX.
118) A.C. Weber, J. H. Lang, A.H. Slocum, "{111} Si etched planar electrical contacts for power MEMS-relays", 53rd IEEE Holm Conference on Electrical Contacts, September 2007, Pittsburgh, PA
119) H. Ma, J. H. Lang, and A. H. Slocum, "Design of an Electrochemical Impedance Test Cell with Servomechanically Adjustable Cell Constant," in IEEE Sensors Conference, Atlanta, GA, 2007.
120) *M.B. Read1, A.C. Weber1, R. Martens1, O Yaglioglu, J.H. Lang, A.H. Slocum, "A Highly Repeatable MEMS Based Electrical Contact Test System", euspen annual mtg, Zurich June 2008.
121) *E. Bassett, A. Slocum, "Forces in a Flexible Member Passing Through a Curved Tube", euspen annual mtg, Zurich June 2008.
122)

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*Outgrowth of supervised student research.

4. Other Major Publications:

1) Slocum, A. H., (Executive Producer) for inner-city kids' rap group Mental Block, their first CD entitled "IF".
2) Slocum, A. H., (Executive Editor) for Marc Graham's book of poems and images entitled "JoTLS" (Journey of The Lost Souls) www.jotls.com .

5. Internal Memoranda and Progress Reports:

None

6. Invited Lectures:

1. April 1986, "Flexible Automated Fixturing Systems," SME Conf. on Jigs and Fixtures, Cincinnati, OH.
2. Dec. 1986, "A Five Axis Robotic Micromanipulator," ASME Winter Annual Meeting, Anaheim, California.
3. Dec. 1986 "A Servo-Controlled Pneumatic Double Gripper with Changeable Fingers," ASME Winter Annual Meeting, Anaheim, CA.
4. Sept. 1989, *Precision Machine Design,* Short course for the American Society for Precision Engineering Annual Meeting in Monetary, CA.
5. Sept. 1990, *Precision Machine Design,* Short course for the American Society for Precision Engineering Annual Meeting in Rochester, NY.
6. Oct. 1991, *Precision Linear Motion Bearing Design,* Short course for the American Society for Precision Engineering Meeting in Santa Fe, NM.
7. Oct. 1991, *Error Budgeting and Machine Modeling,* Short course for the American Society for Precision Engineering Meeting in Santa Fe, NM.
8. Oct. 1992, *Actuators for Precision Machines,* Short course for the American Society for Precision Engineering Meeting in Orlando, FL.
9. Oct. 1992, *Applications of Ceramic Materials in Precision Machines,* Short course for the American Society for Precision Engineering Meeting in Orlando, FL.
10. Nov. 1993, *Actuators for Precision Machines,* Short course for the American Society for Precision Engineering Meeting in Seattle, WA.

11. Nov. 1993, *Applications of Ceramic Materials in Precision Machines,* Short course for the American Society for Precision Engineering Meeting in Seattle, WA.
12. Nov. 1993, *Design of Damping Systems for High Precision Machines,* Short course for the American Society for Precision Engineering Meeting in Seattle, WA.
13. Nov. 1994, *Actuators for Precision Machines,* Short course for the American Society for Precision Engineering Meeting in Cincinnati, OH.
14. Nov. 1995, *Actuators for Precision Machines,* Short course for the American Society for Precision Engineering Meeting in Phoenix, AZ.
15. Oct, 2000, *Getting Students Psyched about Engineering and Science*, Robofesta Conf., Osaka, Japan
16. Nov. 2000, *Advances in Machine Tool Design*, ASME Winter Annual Meeting, Orlando, FL
17. July 2001, *Advances in Machine Elements*, keynote address, 10 International Conference on Precision Engineering, Yokohama, Japan.
18. Nov. 2002, *Mechanics of Designing Precision Machines*, Harvard University, Division of Engineering and Applied Science Dept. seminar
19. April. 2003, *The Nanogate*, Harvard University, Division of Engineering and Applied Science Dept. seminar
20. June 2003, *Characterization and Fabrication of the NanoGate for Nanoscale Fluidics, Wireless Communications, and ?,* NSF Workshop on Nanoscale Mechanical Engineering, Arlington, VA Nov. 2002
21. Nov. 2003, *Advances in Precision Machine Design*, keynote speaker, Mechatronics, Automation and Control Symposium of the COBEM 2003 Sao Paulo Brazil
22. Nov. 20, 2003, "Fundamentals of MEMS machines", Invited lecture, University of Florida
23. March 22, 2004, "Fundamentals of Precision Machine Design", invited lecture, Brigham Young University
24. March 22, 2004, "Applying Macro Machine Design Experience to Dinky Designs", invited lecture, Brigham Young University
25. May 17, 2004, "Fundamentals of Precision Machine Design", invited lecture, Ohio State University
26. June 2, 2004, "Magnetically Preloaded Friction Drive System", Invited keynote speaker, European Union Society for Precision Engineering & Nanotechnology annual meeting.
27. Sept. 6, 2004, "A design Environment to Teach Students about Optimal Transmission Ratios", 4th. Intl. Conf. Advanced Engineering Design, Glasgow, Scotland, Sept. 5-8, 2004.
28. Sept 14, 2006, "Design of Small Precision Machines", ICOMM Univ. of Illinois UC, keynote address:
29. Oct. 16, 2007, "Water Hydrostatic Bearings for Precision Machine Tools and Industrial Machinery", invited talk, ASPE Annual Mtg

Theses Supervised by Alexander H. Slocum

	Total	Completed	In Progress
S.B.	81	79	2
S.M.	43	41	2
Engineers	1	1	0
Doctoral Supervisor:	41	33	8
Doctoral Reader (committee member):	29	27	2

S.B. Theses:

1. Robinson, Darryl K., "Design of a Prototype Fastening System for the Trackbot Automated Construction Robot," May 1986.
2. Kang, Jiin, "Design of a Track Positioning Mechanism for an Interior Wall Construction Robot," June 1986.
3. Paulson, Bruce A., "Design of a Materials Handling System to Automate Interior Wall Construction," June 1986.
4. Thackston, III, George W., "Design of an Automatically Guided Vehicle for Use in Automated Drywall Construction," June 1986.

5. Gladwin, S. C., "Design and Assembly of a Construction Robot Subsystem to Fasten Drywall to Studs," June 1986.
6. Shiller, Andrew., "Kinematic Analysis of A Precision Slide," June 1987.
7. Gregory, Arthur, "Vacuum Gripper Design for Automated Assembly,", June 1987.
8. Wurman, Peter, "Anechoic Chamber Design and Acoustical Analysis of Room 1-051," June 1987.
9. Heatzig, Eric, "Scafbot-A Servo Controlled Scaffolding Device," June 1987.
10. Huang, Stanley, "Design and Implementation of a Software Controller for a Wall Building Robot,"June 1987, (Electrical Engineering and Computer Science).
11. Barrientos, Miguel, June 1993, "Tools for Developing Countries".
12. Mateo, Evan, "Semiconductor Wafer Gripper", June 1994.
13. Phillips, Alton, "Electrostatic Air Cleaner", June 1994.
14. Breinlinger, Keith J., "A Handbook to show 2.007 Students How to Better Utilize the Materials in the 2.007 Kit, " February 1996
15. Percer, Adrian C., "2.007 Briggs and Stratton Lawnmower Engine Exercise, " June 1996
16. Estan, Basak, "Modeling Methods Using Computer Aided Design, " June 1996.
17. Shull, Craig M., "Fundamentals of the 2.007 Design Process, " June 2006
18. Goldstein, Evan D., "The Design Process as Employed in the Introduction to Design Class at MIT, " June 2006.
19. Hicks, Robert J., "A Proposal for the 2.007 Book: Instrument to Design, " February 1997
20. Youngbear, Kathy, "Optimization of Cross-Sectional Configuration of an Extruded Plastic Truss, " June 1997.
21. Richkus, Rebecca, "Performance Limiters in the Clamping Mechanism of Injection Molding Machine, " June 1997.
22. Schmidt-Lang, Michael P., "The Design of a Simple Wind Tunnel Test Stand for Measuring Lift to Drag Ratio, " June 1997.
23. Pellegrini, Brian J., "Guide to the Design Process through the MIT 2.70 Contest, " June 1997.
24. Melvin, Jason W., "Design of a Kinematic Coupling for Machine Tool Fixturing, " June 1997.
25. Lehman, David M., "The Design Process: MIT 2.70 Contest, " June 1997.
26. Burn III, Robert D., "Simulator Chair Design: Ergonomics and Vibration, "June 1997.
27. Shah, Raj, "Creation of a Website for the Purposes of Archiving Course-Related Material," June 1997.
28. Allen, Holly, "Multimedia as a Teaching Tool in 2.007, " June 1998.
29. Miller, John, "Design of an Anti-Backlash Transmission for Position Control Applications, " June 1998.
30. Butville, Michael, "Driveshaft Design for a Dynamometer Utilizing Rotary Motion Flexural Bearings, " June, 1998.
31. Durant, Lawrence C., "Administration of the Urban Design Corp. and the Implementation of Design in Hip Hop Production, " February 1999.
32. Prieto, Rodrigo, "2.007 Contest Design and Machine Design, " June 1999.
33. Cooperman, Seth J., "The History, Mechanics, and Psychology of Magic, " June 1999.
34. Cortesi, Roger S., "Designing a Mechanical Engineering Contest, " June 1999.
35. Sprunt, Alexander D., "A Three Axis CNC Router Design, " February 2000.
36. Breinlinger, Joshua E., "Design and Construction of a Linear Induction Powered LEGO Roller Coaster, " June 2006
37. Fuertes, Amilcar, "Read and Do with the Animaroos, " June 2006.
38. Davis, Wallace B., "Design and Cost Optimization of a Cast Concrete Constrained Layer Vibration Damper, " September 2000
39. Loiselle, Phillip J., "Thermal Stability of Kinematically Coupled Microscope Stack Structure, " June 2001
40. Moon, Daniel K., "Flexure Based Mounts for Sensitive Payloads: A Management and Engineering Stack Study (Course 2B), " June 2001
41. Harper, Christopher, "Resdesign of Industrial Pin Joint Test Apparatus, " June 2001
42. Chouinard, Natalie, "Design Process of a 2.007 Design and Manufacturing Contest Table, " June 2001
43. Arguelles, David, "Design and Manufacture of a BattleBot, " June 2001
44. Sanchez, Manuel A., "Planteez Business Plan and Preliminary Research, " June 2001
45. Kisai, Darul "Mechanical Design of Chassis and Drivetrain for an Autonomous Mobile Robot, "June 2001

46. Montgomery, Sean J., “An Analysis of the Dynamics of the 2001 2.007 Contest Table with an Overview of its Application to Table Design Choice, " June 2001
47. Harper, Kelly, “Redesign of Industrial Pin Joint Test Apparatus, " June 2001
48. Shur, Maiya, “Design and Manufacturing of a Device Prototype for Performing Combined Ultrasound and X-Ray Mammography, " June 2002
49. Bernstein, Oren, “Wireless Touch Pads for Competitive Swimming, "June 2002
50. Bravard, Marjory A., “Design and Implementation of an Electrical System for a Combined Ultrasound and X-ray Mammography Breast Imaging Device, " June 2002
51. Ferguson, Kevin M., “Design and Fabrication of the Testing Apparatus for the Characterization of the Z-axis Flexure in the MIT-PERG/UIUC-LFD High-Precision Microscope Project, " June 2002
52. Praster, Stephanie M., “Prototype Development of Linear Actuator System to Enable Breast Ultrasound, " September 2002
53. Roberts, Michael H., Approximation of Air Bearings as Linear Point Springs: Verification of an Analytical Model for a New Five-Axis Machine Tool”, June 2002
54. Bloomsburgh, John G., “Sealing and Heat Transfer Analysis of Gas Flow through Alumina Tubes in a Tube Furnace, " June 2003.
55. Jacobs, Alex T., “Development of a Right-Angle Gearbox Design Module for Use in Undergraduate Mechanical Design Curriculum, " June 2003
56. Varady, Eric J., “Design and Manufacture of the 2003 2.007 Wireless Control Boxes, " February 2004.
57. Browne, Courtney, “Design of a 2.007 machine with All-Terrain Suspension, " June 2004.
58. Read, Melissa, “Designing a Better Hair Straightener, " June 2004
59. Kahn, Christopher, “Solution for Modular Die-Level Anodic Bonder, "June 2004.
60. James, Richard, “Design of an Alumnium Differential Housing and Driveline Component for High Performance Application Abstract, " June 2004.
61. Figueroa, Victor A., “Designing a Mechanism to Cleave Silicon Wafers, "September 2004.
62. Mukaddam, Kabir, “Design of a Silicon Wafer Fracturing Instrument, " February 2005.
63. Gomez III, Nicasio, “PCV Valve Flutter: Vibration Characterization through Pressure and Flow, "June 2005
64. Held, David, “Modeling and Control of a Silicon Substrate Heater for Carbon Nanotube Growth Experiments, " June 2005.
65. Fonder, Gregory Paul, “The Back Stroke Buddy, "June 2005
66. Bonas, Calvin, “Re-Usability of Plastics, " June 2005
67. Jonnalagadda, Aparna S., “Passive Microfluidic Interconnects, "June 2005
68. Shu, Yuan, “Tabletop Robot to Aid in Arm Rehabilitation of Stroke Patients, "June 2005
69. Su, Benjamin W, “Wheelchair Exercise Roller Product Design, " June 2005
70. Johnson, Philip Tyler, “Development and Design of an Adjustable Elastic Support System for Ensuring Safety While Learning Physical Skills, "June 2005
71. Nelson, Alexandra T., “Press Fit Design: Force and Torque Testing of Steel Dowel Pins in Brass and Nylon Samples, "June 2005.
72. Trangle, Etan S., “SmartBat: A Baseball Swing Analysis and Training Product, "June 2005.
73. Smith, Benjamin D., “HandSkates: An Apparatus for physically Intelligent Exercise, " June 2005.
74. McKenney, “The Design and Development of Aquatic Exercise Shoe Flags, "June 2005.
75. Hatton, Ross L, “Plant Design for Deterministic Control of STEMs and Tape-Springs," June 2005.
76. Lin, Wey-Jiun, “Product Realization of the 2.007 Control Box, " June 2006
77. Yang, Tiffany, “The Wall-Mill: The Design of a Flexible Machine for the In-Situe Architectural Machining of Surfaces, "June 2006.
78. Tsai, Helan, “Swimming Fins for Strengthening the Inner Quadriceps Muscle”, June 2007
79. Juan Herrera, “Wall Miller”, June 2007
80. Colton, Shane, “Energy harvesting power electronics”
81. Bosworth, Will, “Adjustable Kinematic Coupling”

S.M. Theses:

1) Hou, William M., "Conceptual Design of an Automated System for Emplacement and Retrieval of Nuclear Waste," January 1987.
2) Schena, Bruce, "Design Methodology for Large Work Volume Robotic Manipulators: Theory and Application," Sept. 1987.
3) Gedney, Richard, "Sensor and Control System Design for Automated Testing of Structural Materials," January 1988.
4) Damazo, Bradford, "Mechanical, Sensor, and Control System Design of an Accelerometer Calibrator with One Part Per Million Accuracy," January 1988.
5) Ousterhout, Karl, "Design of a Force and Position Servo Controlled Robotic Gripper with a 50:1 Grip Force to Weight Ratio," January 1988.
6) Levy, David, "Studbot: A Construction Robot for the Automated Assembly of Steel-Stud Partition Walls," Sept. 1987.
7) Ziegler, Andrew, "Studwelder: A Construction Robot for In-Situ Automated Welding of Shear Studs," June 1988.
8) Heatzig, Eric, "Modular digital servo controller," June 1989 (Civil Engineering).
9) Carey, John, "Methodologies of Controller Design for Precision Linear Motion Systems," June 1992.
10) Gaub, Heinz, "Hydrostatic Linear Motion Bearings for Precision Machine Tools," June 1992.
11) Schmeichen, Philip, "Design of Precision Kinematic Systems", Jan. 1993.
12) Bhathena, Firdaus, "Mapped Control Systems for Precision Machines" (Co-supervisor with Prof. Lang), June 1993.
13) Mintz, David, "Precision Measuring Systems", June 1993.
14) Smith, Michael, "Adaptive Control Systems for Precision Machines" (Co-supervisor with Prof. Annaswamy), June 1993.
15) Brünner, Christoph, "Self Compensating Hydrostatic Bearings for Grinding Machine Tables", January 1994.
16) Chiu, Michael, "Design of a Precision High Speed Tool Servo", January 1994.
17) Wasson, Kevin, "High Speed Hydrostatic Spindle Design" 1994.
18) Culpepper, Martin, “Design of Debris Cleaner Using a Compound Auger and Vacuum Pick Up”, January 1997.
19) Scrivens, Jevin, “A Wireless Robot for Semiconductor Manufacturing Equipment”, June, 1997.
20) Houdek, Phillip, “Design and Implementation Issues for Stewart Platform Configuration Machine Tools”, June 1997.
21) Alden, John, “Active Kinematic Coupling”, June 1997.
22) Ellahi, Farooq, “An Integrated Decanter Centrifuge-Pitot Pump”, June 1997
23) Brienlinger, Keith, “Hexapod Home Flight Simulator”, August 1998.
24) Balakrishnan, Asha, “Planarized Ball Grid Arrays”, June 1999.
25) Schmidt-Lange, Michael, “A graduate level treatment of the design of a machine for the 1999 2.007 Contest,”, June 1999.
26) Rohatgi, Gaurav, “Damped Tool Holder”, Approaches for Chatter Reduction in Deep Cavity and Intricate Surface Milling, June 1998.
27) Cortesi, Roger, "An Easy to Manufacture Non-Contact Precision Linear Motion System and Its Applications", August 2000
28) Sprunt, Alex, “Electrical Contact tester”, June 2002
29) Robertson, Alec, “Precision Aerostatic Spherical Joint”, June 2003
30) Montgomery, Sean, “Electronics Curriculum for 2.007”, June 2003
31) Werkmeister, Jaime, “Mesomill”, June 2004
32) Thompson, Kate, “MEMS Fluid Coupling”, June 2004
33) Abu-Ibrahim, Fadi, “Low-cost precision waterjet”, June 2004
34) Vanderpoel, Timothy, “Design of a Snowboard Simulating Exercise Device”, June 2005
35) Figueredo, Stacy, “Monolithic Plastic Biopsy Device”, June 2006
36) Durand, Keith, “Design of an Energy Efficient and Economical Actuator for Automobile Windows”, June 2007
37) Jonnalagadda, Aparna, “Automotive Energy Harvesting”, Jan. 2007
38) Trimble, Zachary, “Rotating Energy Harvesting Device”, June 2007
39) Rothenhofer, Gerald, “Hydrocline linear motion axis”, June 2007
40) Zurovcik, Danielle, “Negative Pressure Wound Therapy Device”, June 2007

41) Kuhn, David, “Desktop systems for manufacturing carbon nanotube films by chemical vapor deposition”, June 2007
42) Bassett, Erik
43) Sarah Edinger

Engineer Degree
1) Werkmeister, Jaime, "Development of Silicon Insert Molded Plastic (SIMP)", June 2005

Doctoral Theses, Supervisor:

1) Demsetz, Laura, "Methodology for Formulating Designs of Task Specific Automated Construction Machinery", Jan. 1989. (Civil Engineering).
2) Everett, John, "Construction Automation: Basic Task Selection and Development of the Cranium", June 1991. (Civil Engineering).
3) Marsh, Eric, "Design of Precision Coordinate Measuring Machines", June 1994.
4) Van Doren, Matthew, "Precision Machine Design Methodology for Design of Semiconductor Processing Equipment", June 1995.
5) Scagnetti, Paul, "Design of Precision Grinding Machines for Ceramics", January 1996.
6) Ho, Chris, “Concurrent Development of a Rotationally-Symmetric Barb Joint for Modular Storage Systems through Product Innovation Research”, June 1997.
7) Levy, David, "Portable Product Miniaturization and the Ergonomic Threshold", August 1997.
8) Braunstein, Daniel, “Precision Printed Circuit Board Manufacturing”, August 1997.
9) Chiu, Michael, "High Precision Semiconductor Equipment Test Design", January 1998.
10) Nayfeh, Samir, “Design and Application of Damped Machine Elements”, June, 1998.
11) Pfahnl, Andreas, "Design of Precision Temperature Controlled Precision Machine Tools", June 1998.
12) Hale, Layton, "Error Budgeting Tools for Precision Machine Design", January 1999
13) Hochmuth, Carsten, “Platform Concept for Precision Machining Centers", January 1999
14) Kiani, Sephir, “Multi-connection vias for printed circuit boards", January 1999.
15) Vallance, Ryan, “Precision Miniature Mechanism Manufacture", June 1999.
16) Muller, Luis, “Modular Semiconductor Test, Assembly & Packaging Manufacturing Equipment Design”, June 1999.
17) Kane, Nathan, "Surface Self-Compensated Modular Linear Hydrostatic Bearings", June 1999.
18) Culpepper, Martin, “Design and Application of Compliant Quasi-Kinematic Couplings”, January 2000.
19) Bamburg, Eberhard, “Principles of Rapid Machine Design", June, 2001.
20) O’Sullivan, Donald, “Structural Elements with Mathematically Defined Surfaces for Enhanced Structural and Acoustic Performance”, August 2001.
21) White, James, “The Nanogate: Nanoscale Flow Control”, June 2003.
22) Qiu, Jin, “An Electrothermally-Actuated Bistable MEMS Relay for Power Applications”, June., 2003.
23) Brienlinger, Keith, “Three Dimensional Routed Manifolds with Externally Inserted Cables”, June, 2003.
24) Sihler, Joachim, “A Low Leakage 3-Way Silicon Microvalve”, January 2004
25) Awtar, Shorya, “Synthesis and Analysis of Parallel Kinematic XY Flexure Mechanisms”, January 2004
26) Li, Jian, “Electrostatic Zipping Actuators and Their Application to MEMS”, January 2004
27) Pat Willoughby, “Elastically Averaged Precision Alignment”, June 2005
28) Sprunt, Alexander, "A Variable Capacitor Made from Single Crystal Silicon Fracture Surface Pairs", August 2005
29) Yang, Xueen, “MEMS LC Tunable Filter”, June 2005
30) Graham, Marc, “Product Development by Deterministic Design”, June 2006
31) Hart, Anastassios John, “Continuous Growth Nanotubes”, August 2006
32) Yaglioglu, Onnik, “Carbon Nanotube Based Electromechanical Probes”, June 2007
33) Freeman, David, “Resonator PCV Valve”, work initiated Sept., 2000
34) Ma, Hong, “Dielectric Spectroscopy”, work initiated Sept., 2003
35) Weber, Alexis, “MEMS KOH Relay”, work initiated Sept., 2005
36) Thompson, Mary Kate, “A Multi-Scale Iterative Approach for Finite Element Modeling of Thermal Contact Resistance”, August 2007
37) Figueredo, Stacy, TBD

38) Hanumara, Nevan, “biopsy needle robot”
39) Walsh, Conor, “medical robot control system”
40) Read, Melissa, “MEM S Electrical Probes”
41) Rothenhofer, Gerald, “Silicon Wafer Grinder”, work initiated Jan., 2007

Doctoral Theses, Reader:
1) Bausch, John J. III, "Kinematic Methods for Automated Fixture Design", Jan. 1990.
2) Trumper, Dave, "Magnetic Suspension Techniques for Precision Motion Control", Sept. 1990 (Electrical Engineering and Computer Science).
3) Chai, Jangbom, "Non-Invasive Diagnostics of Motor-Operated Valves", June 1993.
4) Mosleh, Mohsen, "The Role of Wear Particles in Geometrically Constrained Frictional Systems in Dry Sliding", June 1994.
6) Walczyk, Daniel, "A Complete Sheet Metal Forming System Incorporating a New Quick Protyping Method for Dies", January 1996.
7) Frey, Daniel, “Using Product Tolerances to Drive Manufacturing System Design“, June 1997.
8) Williams, Mark, “Precision Six Degree of Freedom Magnetically-Levitated Photolithography Stage”, October 1997.
9) Pfahnl, Andy, “Design of a Thermal Control System for an IC Test-In-Tray Handler”, June 1998.
10) Ludwick, Stephen, "High-Speed Lens Cutting Machine", MIT, Mechanical Engineering, June, 1999.
11) Liebman, Michael, "Five-Axis Grinding Machine for Centimeter-scale Parts", MIT, Mechanical Engineering, June 2002.
12) Sweetland, Mathew, “Precision Thermal Control System for Semiconductor Devices Under test”, MIT, Mechanical Engineering, June 2002.
13) Meggiolaro, Marco, "Achieving Fine Absolute Positioning Accuracy in Large Powerful Manipulators", Mechanical Engineering, June 2002.
14) Hidrovo, Carlos, “Development of a Fluorescence Based Optical Diagnostics Technique and Investigation of Particle Ingestion and Accumulation in the Contact Region of Rotating Shaft Seals”, Mechanical Engineering, June 2001.
15) Sujan, Vivek, "Compensating for Model Uncertainty in the Control of Cooperative Field Robots", June, Mechanical Engineering, 2002.
16) Konkola, Paul, “Phase Interference Gratings”, Mechanical Engineering, June, 2003
17) Savran, Cagri, “A Robust Micromechanical Sensor for Label-free Biomolecular Detection in Real-time”, Mechanical Engineering, Jan. 2004
18) Griffith, Saul, “Self Assembling 3D structures”, Mechanical Engineering, June 2004
19) Kevin Turner, “Wafer Bonding: Mechanics-Based Models and Experiments”, Mechanical Engineering, June 2004
20) Eric Wilhelm, “Printed Electronics and Micro-Electromechanical Systems”, Mechanical Engineering, June 2004
21) Hai Ning, “Building E-Education Platforms For Design-Oriented Learning:, Civil Engineering, June 2004.
22) Sparks, Andrew, "Scanning Probe Microscopy With Inherent Disturbance Suppression Using Micromechanical Devices", Mechanical Engineering, Sept. 2004
23) Andrew Wilson, “Wafer Bonding”, June 2004
24) Kripa Varanasi “Damping mechanisms”, June 2004
25) Hashemi, Fardod, “Nanotweezers”, June 2005
26) Rick Montesanti, “High speed tool servo”, June 2006
27) Balakrishnan, Asha, “Development of Novel Dynamic Indentation Techniques for Soft Tissue Applications”, August 2007
28) Winter, Amos, “burrowing robots”, in progress
29) Yamamoto, Namiko, “CNT reinforced composites”, in progress

EXHIBIT 3

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 4

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 5

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 6

UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

----------X

KEURIG, INC.,

Plaintiff,

- against -

KRAFT FOODS GLOBAL, TASSIMO CORPORATION, KRAFT FOODS INTERNATIONAL,

Defendants.

C.A. NO. 07-17 GMS

----------X

120 Park Avenue
New York, New York

March 4, 2008
2:00 P.M.

Examination Before Trial of HELEN GLUS, pursuant to Notice, taken by and before Renee S. Harris, a Notary Public and Shorthand Reporter of the State of New York.

ELLEN GRAUER COURT REPORTING CO. LLC
126 East 56th Street, Fifth Floor
New York, New York 10022
212-750-6434
REF: 86800

GLUS

A. Okay.
Q. Do you know if the cartridges available either in Rye Brook in '95 or at the 120 Park Avenue in '96 through 2000 had a hole like this that was open into the cartridge?
A. I don't know.
Q. So you don't know if they had an open hole like this, or if there was some sort of a sealed hole?
A. I have no idea.
Q. And I just want to make sure, so would that be your same answer for every year, '96, '97, '98, '99 and 2000 at the Park Avenue location and any year, '95, '96, '97, '98, '99 and 2000 for the Rye Brook location?
A. That would be my same answer, yes.
(A DOCUMENT WAS RECEIVED AND MARKED PLAINTIFF'S EXHIBIT 102, IN EVIDENCE, AS OF THIS DATE.)
Q. Would you please mark this as Plaintiff's 102.
Would you take a moment to look at that document which is marked as Plaintiff's 102,

GLUS

which bears the 177210 through 211.
A. Okay.
Q. Do you recognize that document?
A. Yes, I do.
Q. And is that your signature at the bottom?
A. Yes.
Q. So you wrote this document; you wrote this letter?
A. Yes.
Q. Do you remember writing this?
A. Yes.
Q. What is this?
A. Following our arranging for Philip Morris capital corporate to receive a machine, I placed an initial order of supplies for them and told them who it should be sent to and advise them that Jerry Flatly would be making their orders from now on; and I asked them, you know, who she should contact in the future.
Q. Okay. So it's essentially an order for some Kenco's singles cartridges, and it appears some capsule storage units; is that

GLUS

correct?
A. Yes.
Q. Can you walk me through the process of ordering the Kenco's single cartridges? And I think you went through a fair number of these with Mr. Shlitz.
So would you write a letter or a memo like this letter marked as Plaintiff's Exhibit 102; is that correct?
A. Yes.
Q. And you would go ahead and order some Kenco's singles cartridges using these types of letters or memos?
A. Yes.
Q. Here it's referred to, or something's referred to as the Michigan machine; do you see that?
A. Yes.
Q. What is the Michigan machine?
A. I have no idea. It's the name my boss used for it. I don't know. But I've heard it referred to as Kenco or Michigan.
Q. Okay. So the Michigan machine --
A. The Kenco machine.

GLUS

Q. Is the Kenco machine, and is that the Kenco machine here at 120 Park Avenue?
A. That we had at the time.
Q. Okay. So were all of the Kenco brewers, not all of them, the Kenco brewer that was used at 120 Park Avenue between '96 and about 2000 and the Kenco brewer used in the Rye Brook location in '95, those are both referred to as the Michigan machine?
A. Michigan or Kenco.
Q. Do you have any idea why it was given the name the Michigan machine?
A. I have no idea.
Q. So these orders, you would send them to Liz Matthews?
A. Various people and sort through the others, Carol, various people.
Q. I guess we'll start with Liz Matthews. Who is Ms. Matthews?
A. I don't recollect what her job title was. I think I initially started out going to Ronny Bell's secretary, and I don't remember if that's Liz Matthews or not; and eventually I was given other names to

GLUS

Q. You said when the delivery came in, did the delivery come to you on the 22nd floor of the 120 Park Avenue?

A. It came into our receiving department, and they brought it upstairs to me.

Q. And they brought it directly to you?

A. Yes.

Q. And you were responsible for placing those cartridges into the kitchen near the brewer?

A. Yes.

Q. I believe you earlier said one of your favorite flavors was medium roast; was that correct?

A. Of the coffees, yes.

Q. So the medium roast was one of the flavors that was available in the Kenco's singles cartridges at the Rye Brook and at the Philip Morris, 120 Park Avenue?

A. I don't recall in Rye Brook, because I think I only drank tea in Rye Brook.

Q. Do you recall when the medium roast Kenco's singles cartridges were available at

GLUS

the 120 Park Avenue location?

A. I think almost immediately when we got the machine.

Q. So you think they were available in, I guess it was '96?

A. Yes.

Q. Were they also available in '97?

A. Yes, I believe so. Up until whenever.

Q. So they were available each year from '96 through about 2000?

A. Yes.

Q. But you're not sure if they were available at the Rye Brook location in '95; is that correct?

A. Yes.

Q. Earlier you testified that I believe anybody who worked on this floor had access to the Kenco brewer at the 120 Park Avenue location; is that correct?

A. Among others, yes.

Q. Okay. And that's what I want to focus on is partially among others, but first I want to talk to you about the people that

GLUS

were on this floor, and I think earlier you said that there were anywhere between 12 and 16?

A. Correct.

Q. I guess they were Kraft employees?

A. Philip Morris employees.

Q. Philip Morris employees, which is a related company of Kraft?

A. Parent company.

Q. Parent company. Between '96 and 2000?

A. Correct.

Q. And I believe you testified that the Kenco brewer that was available on the 22nd floor of the 120 Park Avenue location was always located in the kitchen on the 22nd floor?

A. That's right.

Q. You also mentioned that visitors had access to the brewer; is that correct?

A. Yes.

Q. So would a visitor be able to go to the kitchen unless escorted and use the Kenco brewer?

GLUS

A. Yes.

Q. Here on the 120 Park Avenue location?

A. Yes.

Q. I'm a visitor here today at this location, and I was issued a badge. So to enter the building, I was able to come into the main lobby on the ground floor, but in order to actually enter the building anywhere beyond the lobby, I have to sign in and I guess to be approved to come in.

Is that the normal procedure for visitors to gain access to the building?

A. Yes.

Q. So they would need to be essentially invited or be guests of somebody here at the 120 Park Avenue location?

A. Correct.

Q. So somebody, the general public, just walking down Park Avenue couldn't necessarily come in to this building and get into any of the floors of the building; is that correct?

A. That's correct.

GLUS

Q. So when I entered the building today, I was issued a badge, and the badge had a number of the floor that I was allowed access to. Do you recall if that was the same procedure back through '96?

A. Yes.

Q. So each person or each visitor who would have access to the 22nd floor would have been issued a badge that says 22nd floor, perhaps some other range, but it would have essentially said that they had access to this floor?

A. Correct.

Q. Do you know if the records exist for what visitors had access to the 22nd floor in the years '96 through 2000 for this particular building, 120 Park Avenue?

A. I would have no idea.

Q. Did you maintain any similar records?

A. No.

Q. Did you maintain any records of what visitors came to see Mr. Camilleri between '96 and 2000 here at the 120 Park Avenue

GLUS

location?

A. Didn't keep a record of visitors per se, for whatever appointments he might have had in his calendar; but that's not the only way and doesn't encompass everyone I'm sure.

Q. So there would have been visitors to see other people, other than Mr. Camilleri, who might have had access to the 22nd floor and, the kitchen in particular, on the 22nd floor?

A. Oh, sure.

Q. For the years '96 through 2000, do you recall any specific individual who both had access to the brewer, the Kenco brewer on the 22nd floor here and who actually used the brewer on the 22nd floor?

A. I know that there were to say a specific name, no, but I do know that other people used it.

Q. But at this particular time, sitting here today, you cannot identify any specific individual who both had access to -- and when I say "any individual," any individual who is a visitor and not otherwise an employee

GLUS

working for the company here at this location would have had access to that brewer and who actually used the brewer between '96 and 2000; is that correct?

A. I can't identify them by name.

Q. Okay. Is there any document that could refresh your memory about any individual who might have had access to that Kenco brewer who was a visitor and not otherwise an employee of Kraft who would have had access to that brewer between '96 and 2000?

A. Again, maybe only if I looked at his calendars going back that far.

Q. If you had access to Mr. Camilleri's calendar, would that refresh your memory about who actually used the brewer during the period '96 and 2000? And I say who; any individual who was not otherwise an employee of Kraft?

A. It might.

Q. You testified earlier that you, and nobody else that you were aware of any other Kraft employee here, was under any kind of

GLUS

confidentiality obligation or secrecy obligation related to the Kenco brewer; is that correct?

A. Correct.

Q. All right. And I believe Mr. Shlitz asked you whether there was any such confidentiality obligation related to Keurig incorporated; do you recall that?

A. Yes.

Q. Do you recall if anybody from Keurig incorporated actually ever visited the 120 Park Avenue location between '96 and 2000?

A. Not that I'm aware of.

Q. One individual, Mr. Shlitz mentioned was the inventor of the patent at issue in this case, Mr. Lazarus; do you recall if Mr. Lazarus ever visited 120 Park Avenue between 1996 and 2000?

A. Not to my knowledge.

Q. Mr. Shlitz also mentioned the other inventor, he didn't name him but the name is Rick Bolio, do you recall -- Bolio.

Do you remember if Rick Bolio ever visited the 120 Park Avenue location here

GLUS

between '96 and 2000?
A. Not that I'm aware.
Q. Could you describe to me the location of the kitchen here on the 22nd floor of the 120 Park Avenue location, and in particular, can you describe the location of the kitchen relative to the entrance from the building? So how would you get to the kitchen from the entrance to the building?
A. You would come up to the 22nd floor, go through the glass doors right out here, make a left to the end of the hall; make another left and then another quick left and the kitchen is right there.
Q. Okay. And in order to enter really the space here on the 22nd floor, is there anybody kind of a receptionist or somebody like that that greets people coming in from the elevator lobby?
A. Yes.
Q. So again, a member of the general public couldn't really enter the space here on the 22nd floor without really getting past the receptionist?

GLUS

A. Correct.
Q. Let's talk about the Rye Brook location. Where was the Kenco brewer located at the Rye Brook location in '95?
A. In the kitchen pantry area on the seventh floor on one end of the floor.
Q. Was that building similar to this building in which I guess Kraft at the time, did Kraft occupy the entire building at that location in Rye Brook?
A. No. Philip Morris International, also occupied that building, as well. The seventh floor was -- it was a straight floor on one side, there was an atrium in the middle, and then the other half of the floor was a semi-circle and the pantry was on the PMI side of the hall.
Q. Did that building have a similar security set up as here; that in order to enter the space in the building, you had to go past security?
A. You had to be announced.
Q. And in order to get into the building would you have to be an invited

GLUS

guest of somebody at that location?
A. Mm-hmm.
Q. So either Kraft or Philip Morris?
A. You didn't have to be invited. You could show up unannounced; but as long as they said you could go up.
Q. And would you similarly be issued a badge?
A. Yes.
Q. And would the badge similarly allow access to only certain locations in the building?
A. I'm not really sure how Rye Brook worked in terms of -- I know how it works here I'm very familiar with it. I was only there for a very short time. I don't remember.
Q. Do you know if, again, a log was kept of the various visitors who would have been issued a pass into the building at the Rye Brook location?
A. I don't know if they keep logs.
Q. Was there only one machine, one Kenco machine at the Rye Brook location?

GLUS

A. That I'm aware of.
Q. There's only one here at the 120 Park Avenue location?
A. I believe so.
Q. Do you have any idea why the Kenco brewer is available at the 120 Park Avenue location and the Rye Brook location?
A. Why it was available?
Q. Yes.
A. Well, it was available here because my boss requested it. It was already in Rye Brook when I got there. I don't know why.
Q. Do you have any idea why your boss, Mr. Camilleri, requested it be available here?
A. Because he loved it and it was just convenient and easy and he liked it.
Q. Was it related to any kind of testing by Kraft for the U.S. market?
A. Not that I'm aware of.
MR. SCHLITZ: I'm sorry. What did you say?
THE WITNESS: Not that I'm aware of.

GLUS

Q. Do you have any idea if Kraft or anybody else was collecting customer feedback related to the Kenco brewer here at 120 Park Avenue or Rye Brook?

A. Not that I'm aware of.

Q. Now you're currently a Kraft Foods employee; is that correct?

A. No. Currently Altria Group.

Q. And what is the connection between Altria and Kraft?

A. Well, until a year ago, Altria was the parent company of Kraft.

Q. Is there any current relationship between Altria and Kraft?

A. No.

Q. What is your current position at Altria?

A. I'm executive assistant to Louis Camilleri, chairman and CEO of Altria Group.

Q. And what are your current responsibilities?

A. Secretary. Let's call it what it is.

Q. Do you currently stock any -- as a

GLUS

part of your current position here at Altria, are you responsible for stocking beverages at the -- in the kitchen?

A. No.

Q. Now, what was your previous position prior to your current position?

A. I've been with Mr. Camilleri since he came to the states, so as his secretary, in his various roles: CFO, president of Kraft international, senior VP corporate planning, when he first became CEO, when he became chairman and CEO.

Q. So since '95, you've been -- whatever Mr. Camilleri's various titles have been, you've always been his assistant?

A. Correct.

Q. At least since '95?

A. Correct.

Q. Going back to '95, did your responsibility include stocking beverages for the kitchen?

A. No.

Q. So how did you come about acquiring the responsibility of ordering the Kenco's

GLUS

singles cartridges for the Rye Brook location?

A. Because my boss decided that he wanted this machine. So someone had to order the product and take care of it, so I did.

Q. Okay. But it wasn't otherwise a part of your normal responsibilities --

A. No.

Q. -- to order materials for the kitchen, stock materials for the kitchen?

A. Correct.

Q. And then I guess fast-forwarding a year later to '96 when you moved to the 120 Park Avenue location, at that time did your responsibilities include stocking the kitchen?

A. Can I just -- I didn't order anything in Rye Brook.

Q. Okay.

A. I don't know if that's what you thought. I only started ordering when we got the machine at 120 Park.

And no, it was never part of my job, my normal responsibilities to order beverages.

GLUS

Q. Okay. Just to make sure that I got it right, so at the Rye Brook location back in '95 you never ordered any Kenco's singles cartridge or received or stocked Kenco's singles cartridges --

A. No.

Q. -- at the Rye Brook location?

A. Right.

Q. And going back to 1996 and here at the 120 Park Avenue location, your responsibilities didn't include stocking the kitchen or ordering beverages or anything like that --

A. Correct.

Q. -- other than the Kenco's singles cartridges?

A. Correct.

Q. So at no time were your responsibilities between '95 and 2000 as Mr. Camilleri's assistant, your duties didn't include stocking, receiving and ordering supplies for the kitchen?

A. Other than --

Q. Other than the Kenco's singles.

GLUS

A. Correct.

MR. HRYCYSZYN: I think that's probably all I've got, but if you want to take a break and I'll just look through some stuff and make sure.

(SHORT BREAK TAKEN.)

Q. Ms. Glus, you earlier said that there might be identification of some visitors to the 22nd floor of the 120 Park Avenue location identified in Mr. Camilleri calm's calendar; do you recall that?

A. Yes.

Q. Do you know if Mr. Camilleri still has his calendar from '95, '96, '97, '98, '99 or 2000?

A. We'd have to check. I couldn't say for certainty.

Q. So sitting here today, you're not sure if he has them?

A. I'm not positive.

Q. Have you spoken to Mr. Camilleri about the subject matter of this deposition today?

A. Yes.

GLUS

Q. Did you speak to Mr. Camilleri in particular about visitors of non-Kraft, non-Philip Morris employees who might have had access to the brewer?

A. No.

Q. Sitting here today, can you identify any other person who might know of non-Kraft employees who had access to the brewer on the 22nd floor of the 120 Park Avenue location?

A. I would say maybe family of employees. I mean, I know for myself, I can't say with certainty, but I know for myself, my children have visited many times, even back then.

So it's possible when they came to see me at the office that they went in and they saw it or made something for themselves. That's just an automatic easy one to think of.

Q. Let me make sure I understand. But you're not specifically -- but you don't remember sitting here today that any member of your family did, in fact, go in and use the Kenco brewer with a Kenco singles

GLUS

cartridge some time between '95 and 2000; is that correct?

A. No, I can't say with certainty.

Q. And perhaps my question wasn't clear. Can you identify anybody who could specifically identify any non-Kraft employee who would have used the Kenco brewer here at the 120 Park Avenue location between '96 and 2000?

A. Not at this moment, no.

MR. HRYCYSZYN: That's all I've got.

MR. SCHLITZ: Just a few follow-up questions.

EXAMINATION BY
MR. SCHLITZ:

Q. Ms. Glus, is there a conference room opposite the kitchen that Mr. Camilleri used?

A. Pretty much opposite, just a smidge off, yes.

Q. And the times when visitors were waiting for Mr. Camilleri, did you ever take any of them into the kitchen?

A. Yes.

GLUS

Q. And did they use the machine?

A. Yes, usually what would happen is they were sitting by his office, which was near the kitchen. If he wasn't ready, I would say: Do you want to go in this conference room.

They would say yes, and would you like some coffee, and especially when we used the Kenco machine, because there were so many varieties, it was just easier to bring them in and say, which would you like.

Q. And to get to the bathroom, do you have to pass by the kitchen?

A. Yes.

Q. Last question. Early in your deposition, you testified that you kept a file and that the documents that we have shown you today came out of that file; is that correct?

A. Yes.

Q. Does that file include every document you ever received with regard to the orders of the Kenco singles?

A. Probably most definitely not.

EXHIBIT 7

UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE
----------X
KEURIG, INCORPORATED,
Plaintiff,
-against-
KRAFT FOODS GLOBAL, INC., TASSIMO CORPORATION & KRAFT FOODS, INC.,
Defendants.
----------X

555 South Broadway
Tarrytown, New York 10591

March 5th, 2008
2:00 p.m.

Videotaped Deposition of the Defendant, by: GERALDINE A. GRETO, held pursuant to Court Order, at the above time and place, before Notary Public of the State of New York.

ELLEN GRAUER COURT REPORTING CO. LLC
126 East 56th Street, Fifth Floor
New York, New York 10022
212-750-6434
REF: 86864

GRETO

cartridge, you'll see some things that look like little round cylinders, like little pegs that stick up on the side of the cartridge as opposed to the ribs that are on the other side?

A Yeah.

Q Do you recall seeing those pegs on the Kenco Singles cartridges that were in use in Tarrytown, between '97, and 2000, or White Plains, between '94, and 2000, that you testified earlier were used?

A I don't recall.

Q On the same side as those pegs, do you see kind of a raised block, kind of a raised block of plastic, same side along the edge?

A What do you mean? This?

Q The other side, where the pegs are?

A Yes.

Q If you go ahead and look at the label side of that block of plastic?

A Uh-huh.

Q Do you see any numbers or anything embossed on that piece of plastic?

A No, I don't see any numbers. But

GRETO

my eyes aren't that great. I don't see any numbers.

Q Do you recall if the other cartridges that were in use at the White Plains office or that you testified were in use at the White Plains office, between '94, and 2000, or at the Tarrytown office, between '97, and 2000, had any kind of markings or numbers on that block of plastic?

A I don't recall.

Q Looking at that side of the cartridge marked as Plaintiff's Exhibit 101, I believe it is, do you see kind of a hole, a round tapered indentation on the foil, on the label side?

A You mean this?

Q Yes.

MR. HRYCYSZYN: Just for the record, she is pointing to a tapered round inlet at the top of the cartridge.

Q Do you recall if the cartridges in the White Plains office that you testified were in use at the White Plains, office between '94, and 2000, had a tapered inlet that was opened, such that you could see inside the cartridge like on that one

GRETO

there?

A I think it looked like this.

Q Now, same question for the Tarrytown office. Do you recall if the cartridges that were in use in the Tarrytown office, that you testified were used at the Tarrytown office between '97, and 2000, had an inlet like that, that was open to the inside?

A I think so.

Q I think you said earlier, I believe you testified earlier, that the medium roast was one of the flavors that you had tried, and you liked; is that correct?

A Yes.

Q So was the medium roast flavor of the Kenco Singles cartridges available at the White Plains office in '94?

A Yes.

Q Do you recall if it was also available in '95, '96?

A Always available.

Q It was always available. So it was also then available in 1997, '98, and '99, at the Tarrytown location?

GRETO

A Yes.

Q Earlier today, you looked at some documents. And we can reference to them again if it will refresh your memory. But they had references to something called the Michigan machine. Do you recall that?

A Yes.

Q Do you have any idea why the Kenco Brewer that you used in the White Plains office, and the Tarrytown office, was called the Michigan Brewer?

A No, I don't. It's Project Michigan.

Q Okay, why was it called Project Michigan?

A I don't know.

Q Do you know anybody who would know the answer to that question?

A I would assume Bill Craig would know.

Q Was Bill responsible for that name?

A Not to my knowledge.

Q Bill Craig?

EXHIBIT 8

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 9

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 10

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 440 913 B1

(12) **EUROPEAN PATENT SPECIFICATION**

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B65D 81/00 *(2006.01)* ***A47J 31/40*** *(2006.01)*

(21) Application number: **04250384.7**

(22) Date of filing: **23.01.2004**

(54) **Cartridge for the preparation of beverages**

Patrone zur Zubereitung von Getränken

Cartouche pour la préparation de boissons

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

(30) Priority: **24.01.2003 GB 0301710**

(43) Date of publication of application:
28.07.2004 Bulletin 2004/31

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(56) References cited:
EP-A- 0 272 922
EP-A- 0 334 571
EP-A- 0 451 980
WO-A-01/58786

EP 1 440 913 B1

the above example the milk dispensed for hot chocolate may, typically, be diluted less than the milk added to the coffee. In addition, the milk dispensed for chocolate may be dispensed at a slower flow rate to lessen the degree of foaming of the beverage. Many combinations of cartridges are possible and operating parameters as will be obvious to the skilled person. In addition, the memory may be used to allow the machine 201 to 'predict' the type of beverage that a user will next want to dispense. For example, if a user predominantly drinks one beverage type then the machine can instruct the water heater to remain at the optimum temperature for that beverage type.

Claims

1. A cartridge (1) containing one or more beverage ingredients (200) and being formed from substantially air- and water-impermeable materials, the cartridge defining a storage chamber (130; 134) containing the one or more beverage ingredients and a manifold chamber (16), the cartridge comprising an opening (12) through which the one or more beverage ingredients can be filled into the storage chamber, the opening being closed by a lid (5) having a first portion overlying the manifold chamber and a second portion overlying the storage chamber, **characterised in that** the first portion of the lid is pierceable in use to accommodate an inflow of an aqueous medium into the manifold chamber and the lid is pierceable in use to accommodate an outflow of beverage formed from interaction of the aqueous medium and the one or more beverage ingredients in the storage chamber.

2. A cartridge (1) as claimed in claim 1 further comprising a discharge chamber which is overlain by a third portion of the lid (5) which is pierceable in use to accommodate the outflow of beverage formed from interaction of the aqueous medium and the one or more beverage ingredients in the storage chamber.

3. A cartridge (1) as claimed in claim 2 wherein the discharge chamber comprises a discharge spout (43).

4. A cartridge (1) as claimed in any preceding claim wherein the manifold chamber (16) and the storage chamber (130; 134) are divided by a partition (27) comprising one or more apertures (17; 36).

5. A cartridge (1) as claimed in claim 4 wherein the apertures (17; 36) are sized to prevent passage of the one or more beverage ingredients from the storage chamber (130; 134) into the manifold chamber (16).

6. A cartridge (1) as claimed in any preceding claim wherein the manifold chamber (16) at least partially surrounds the storage chamber (130; 134).

7. A cartridge (1) as claimed in claim 6 wherein the manifold chamber (16) substantially encircles the storage chamber (130; 134).

8. A cartridge (1) as claimed in claim 4 wherein the manifold chamber (16) substantially encircles the storage chamber (130; 134) and the apertures (17; 36) are provided along substantially all of an interface between the manifold chamber and the storage chamber.

9. A cartridge (1) as claimed in any of claim 4 to 8 wherein the apertures (17; 36) have a width of between 0.25 and 0.35 mm.

10. A cartridge (1) as claimed in any of claims 4 to 9 wherein the apertures (17; 36) have a length of between 1.4 and 1.8 mm.

11. A cartridge (1) as claimed in any of claims 4 to 10 wherein between 20 and 40 apertures (17; 36) are provided.

12. A cartridge (1) as claimed in any preceding claim wherein the manifold chamber (16) comprises an inlet portion (26) into which the aqueous medium is introduced, wherein the inlet portion (26) communicates with the remainder of the manifold chamber (16) via one or more openings (30).

13. A cartridge (1) as claimed in claim 12 wherein the inlet portion (26) is circular.

14. A cartridge (1) as claimed in claim 2 wherein the storage chamber (130; 134) and the discharge chamber are divided by an inner member (3).

EXHIBIT 11

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9 June 2005

BY FAX TO: 00 49 89 2399 4465
FROM: +44 20 7430 7600 - 9 Pages
CONFIRMATION BY COURIER

Dear Sirs,

European Patent Application No. 04250384.7
In the Name of KRAFT FOODS R&D, INC.
Our Ref: TBA/NDT/P62225EP00

I write in response to the Communication pursuant to Article 96(2) EPC issued on 2 December 2004 in connection with this application.

The Examiner has objected to the novelty of the independent claims based on the disclosures of EP0272922 (D1) and EP0451980 (D2).

The Examiner contends that the independent claims of the present application lack novelty over the disclosures of D1 or D2. Contrary to the Examiner's suggestion, it is submitted that the cartridges of D1 and D2 do not disclose a first portion of a lid which is pierceable in use to accommodate an inflow of an aqueous medium into a manifold chamber.

D1 and D2 disclose cartridges which are designed to have an inlet 26 which is formed through a rigid polypropylene body portion and not through the laminated foil lid 24, 25. It is a requirement of the independent claims of the present application that the cartridge and the lid are such that the lid is suitable for being pierced to accommodate an inflow of aqueous medium into the manifold chamber. This is not the case in the design of cartridge shown in D1 and D2. With reference in particular to Figure 5 of D1 it can be seen that the underside portion of the body 2 of the cartridge in the vicinity of the inlet 26 is not designed to make it suitable for the laminate in that region to be pierced to form an inlet. In particular, no suitable element is provided against which the inlet piercer on a beverage preparation machine may abut when the inlet is formed. As such, if the design of cartridge shown in D1 or D2 was pierced through the lid, a suitable inlet would not be formed since there would be a large degree of leakage from the underside of the cartridge. It is therefore submitted that D1 and D2 do not disclose cartridges which would be seen by the skilled person as having lids suitable for being pierced to form an inlet.

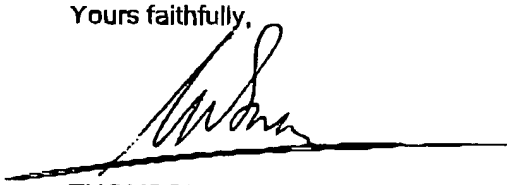
In Paragraph 4 the Examiner has objected that the expression "consistent within 1.0 standard deviations", has no common meaning. It is submitted that the use of this phrase in claim 23 is clear, in particular in light of the content of the description. Reference is directed in particular to the data contained in Tables 1 and 2 on pages 34 and 35 and the accompanying calculations. This passage of the description gives a clear indication of what the percentage of the yield of the beverage produced from the beverage ingredients means and a method for calculating the standard deviation of the yield.

In response to the objection in Paragraph 5, claims 25 to 29 have been deleted. These claims will be the subject of a divisional application in due course.

In response to the objection in Paragraph 6, D1 and D2 have been acknowledged on p1 of the description.

If the Examiner has any further objections to the claims of the present application I request the issuance of a further Examination Report or an opportunity to speak with the Examiner.

Yours faithfully,



THOMSON; Neil David
Authorised Representative
BOULT WADE TENNANT

Encs.

642560; NDT; CMW

CARTRIDGE FOR THE PREPARATION OF BEVERAGES

The present invention relates to a cartridge for the preparation of beverages and, in particular, to sealed cartridges which are formed from substantially air- and water-impermeable materials and which contain one or more ingredients for the preparation of beverages.

It has previously been proposed to seal beverage preparation ingredients in individual air-impermeable packages. For example, cartridges or capsules containing compacted ground coffee are known for use in certain coffee preparation machines which are generally termed "espresso" machines. In the production of coffee using these preparation machines the coffee cartridge is placed in a brewing chamber and hot water is passed though the cartridge at relatively high pressures, thereby extracting the aromatic coffee constituents from the ground coffee to produce the coffee beverage. Typically, such machines operate at a pressure of greater than 6×10^5 Pa. The preparation machines of the type described have to date been relatively expensive since components of the machine, such as the water pumps and seals, must be able to withstand the high pressures.

EP0272922 and EP451980 described beverage cartridges accordingly to the preamble of claim 1.

In WO01/58786 there is described a cartridge for the preparation of beverages which operates at a pressure generally in the range 0.7 to 2.0×10^5 Pa. However, the cartridge is designed for use in a beverage preparation machine for the commercial or industrial market and is relatively expensive. Hence, there remains a requirement

for a cartridge for the preparation of beverages wherein the cartridges and beverage preparation machine are suitable, in

particular, for the domestic market in terms of cost, performance and reliability.

In typical known beverage cartridges the inlet and outlet of the beverage cartridges are formed on opposite sides of the cartridge. This has the disadvantage that the beverage preparation machine used to dispense the cartridges normally requires a complicated mechanical arrangement for moving inlet and outlet piercers into engagement with the cartridge from opposite directions. In addition, the inlet and outlet piercers can also impede access for inserting and withdrawing the beverage cartridge from the beverage preparation machine. In WO01/60220 a beverage cartridge is provided wherein the inlet and outlet are formed on the same side of the cartridge. However, this cartridge can be prone to blockage of the inlet piercers since they contact directly the beverage ingredients.

Accordingly, the present invention provides a cartridge containing one or more beverage ingredients and being formed from substantially air- and water-impermeable materials, the cartridge defining a storage chamber containing the one or more beverage ingredients and a manifold chamber, the cartridge comprising an opening through which the one or more beverage ingredients can be filled into the storage chamber, the opening being closed by a lid having a first portion overlying the manifold chamber and a second portion overlying the storage chamber, characterised in that the first portion of the lid is pierceable in use to accommodate an inflow of an aqueous medium into the manifold chamber and the lid is pierceable in use to accommodate an outflow of beverage formed from interaction of the aqueous medium and the one or more beverage ingredients in the storage chamber.

The present invention also provides a plurality of cartridges, each cartridge as above, wherein the percentage yield of the beverage produced from the one or more beverage ingredients contained in the cartridges is consistent to within 1.0 standard deviations.

The present invention also provides a method of use of a cartridge as described above wherein the cartridge is displaced relative to one or more static piercing elements in order to form the inlet to, and outlet from, the cartridge. This is advantageous in that a simplified piercing mechanism may be utilised which is not required to be articulated or otherwise moved. In addition, since the piercing elements are static a more precise alignment of the cartridge and the piercing elements may be achieved resulting in improved performance and less splashing of the aqueous medium, particularly at the outflow.

In the following description the terms "upper" and "lower" and equivalents will be used to describe the relational positioning of features of the invention. The terms "upper" and "lower" and equivalents should be understood to refer to the cartridge (or other components) in its normal orientation for insertion into a beverage preparation machine and subsequent dispensing as shown, for example, in Figure 4. In particular, "upper" and "lower" refer, respectively, to relative positions nearer or further from a top surface 11 of the cartridge. In addition, the terms "inner" and "outer" and equivalents will be used to describe the relational positioning of features of the invention. The terms "inner" and "outer" and equivalents should be understood to refer to relative positions in the cartridge (or other components) being, respectively, nearer or further from a centre or major axis X of the cartridge 1 (or other component).

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Claims:

1. A cartridge (1) containing one or more beverage ingredients (200) and being formed from substantially air- and water-impermeable materials, the cartridge defining a storage chamber (130; 134) containing the one or more beverage ingredients and a manifold chamber (16), the cartridge comprising an opening (12) through which the one or more beverage ingredients can be filled into the storage chamber, the opening being closed by a lid (5) having a first portion overlying the manifold chamber and a second portion overlying the storage chamber, characterised in that the first portion of the lid is pierceable in use to accommodate an inflow of an aqueous medium into the manifold chamber and the lid is pierceable in use to accommodate an outflow of beverage formed from interaction of the aqueous medium and the one or more beverage ingredients in the storage chamber.

2. A cartridge (1) as claimed in claim 1 further comprising a discharge chamber which is overlain by a third portion of the lid (5) which is pierceable in use to accommodate the outflow of beverage formed from interaction of the aqueous medium and the one or more beverage ingredients in the storage chamber.

3. A cartridge (1) as claimed in claim 2 wherein the discharge chamber comprises a discharge spout (43).

beverage ingredients (200) contained in the cartridges is consistent to within 1.0 standard deviations.

24. A method of use of a cartridge as claimed in any preceding claim wherein the cartridge is displaced relative to one or more static piercing elements in order to form the inlet to, and outlet from, the cartridge.

EXHIBIT 12

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 13

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 14


Kenco
SINGLES
FILTER COFFEE
MEDIUM ROAST
20 UNITS
BEST USED WITHIN
ONE MONTH OF OPENING
Best Before End
09/08
Lot: 7 338 09:10 R1
BAN000033

EXHIBIT 15

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

KEURIG, INCORPORATED, Plaintiff, v. KRAFT FOODS GLOBAL, INC., TASSIMO CORPORATION, and KRAFT FOODS INC., Defendants.	Civil Action No. 07-017 (GMS) **CONFIDENTIAL ATTORNEYS' EYES ONLY**

RULE 26(A)(2)(B) EXPERT REPORT OF PROFESSOR ALEXANDER SLOCUM
APRIL 15, 2008

[redacted]

III. OPINIONS AND BASES

A. Comparison of '762 Patent Claims to T-Disc

Based on my review of the '762 patent, the Court's January 23, 2008 Claim Construction Order, Kraft's T-Discs, and certain documents that I understand were produced in this litigation by Kraft, it is my opinion that T-Discs containing (1) filters and (2) ground coffee or tea products (including espresso, crema, etc.) include all of the elements and features recited in claims 1, 2, 8, 9, and 10 of the '762 patent. Examples of these products have been produced by Kraft as BAN000025, BAN000026, and BAN000027.

Attached as Exhibit C is a claim chart comparing the T-Discs to claims 1, 2, 8, and 9 of the '762 patent. The chart illustrates that the T-Discs include every element of each of those claims.[4] Even though the filter support elements differ slightly in certain T-Discs (e.g., regular versus espresso filter support elements), and some T-Discs are made in a "big" size while others are of a "standard" size, these differences do not affect my analysis of the claim elements.

[4] Claim 10 essentially combines Claims 1, 2, 8, and 9. I do not believe that any additional analysis is necessary for claim 10, as a product that meets all the requirements of Claims 1, 2, 8, and 9 would also meet Claim 10's requirements. While Claim 10 does specify a "planar filter element" rather than a "filter element," the filter elements of the T-Discs are planar in nature. Accordingly, I understand that Kraft concedes this difference in wording to be immaterial.

Element of Claim 8	T-Disc Structure
The beverage filter cartridge of claim 1	Filter T-Discs are covered by claim 1 for the reasons described above.
wherein said outer container is impermeable to liquids and gases.	The outer container of the T-Disc is waterproof and also provides a sufficient barrier to oxygen [redacted]

Element of Claim 9	T-Disc Structure
The beverage filter cartridge of claim 1 or claim 8	Filter T-Discs are covered by claim 1 for the reasons described above.
wherein said lid is impermeable to liquids and gases.	The T-Disc lid includes a layer of aluminum, which is a liquid and oxygen barrier. ([redacted]